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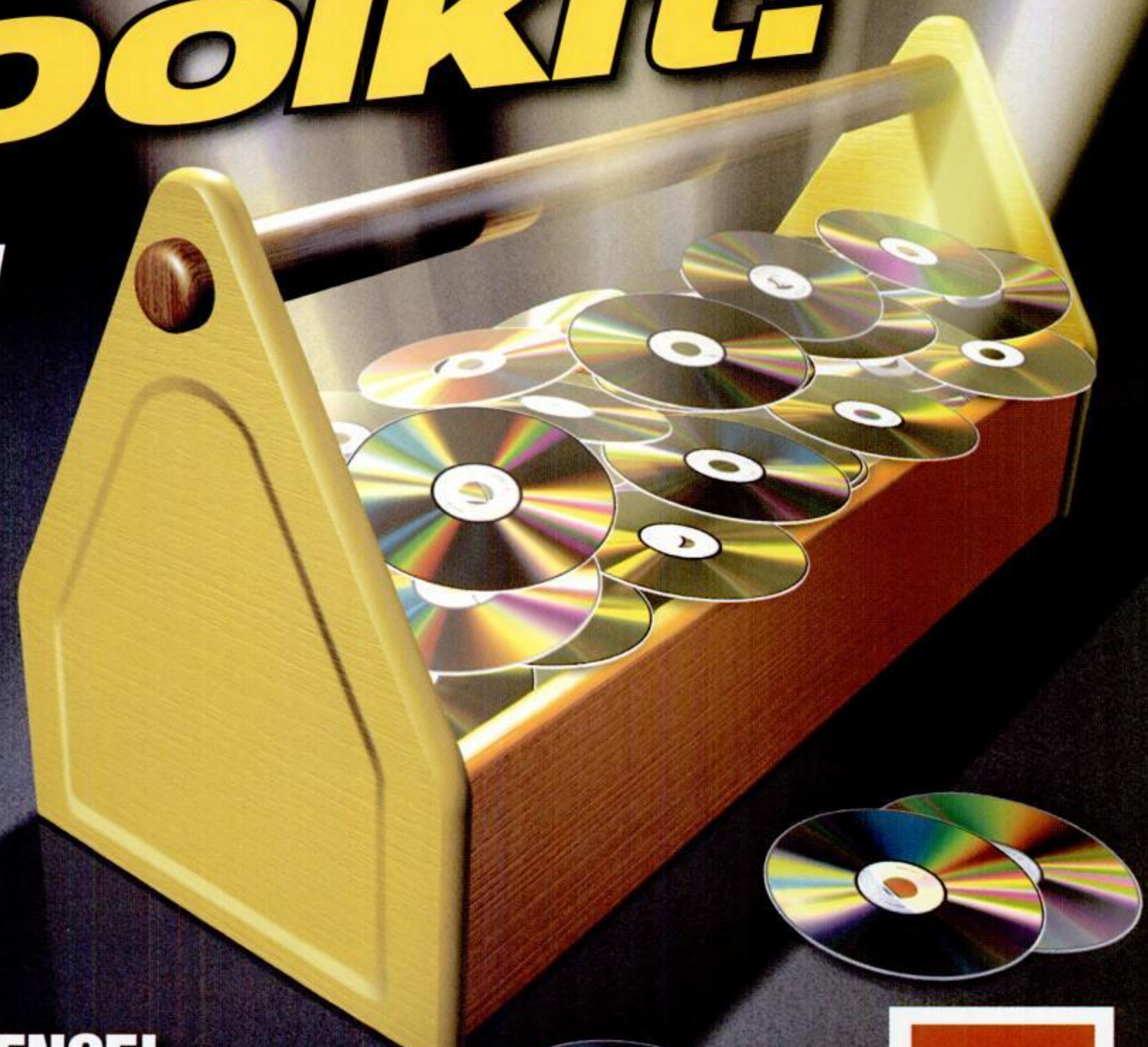

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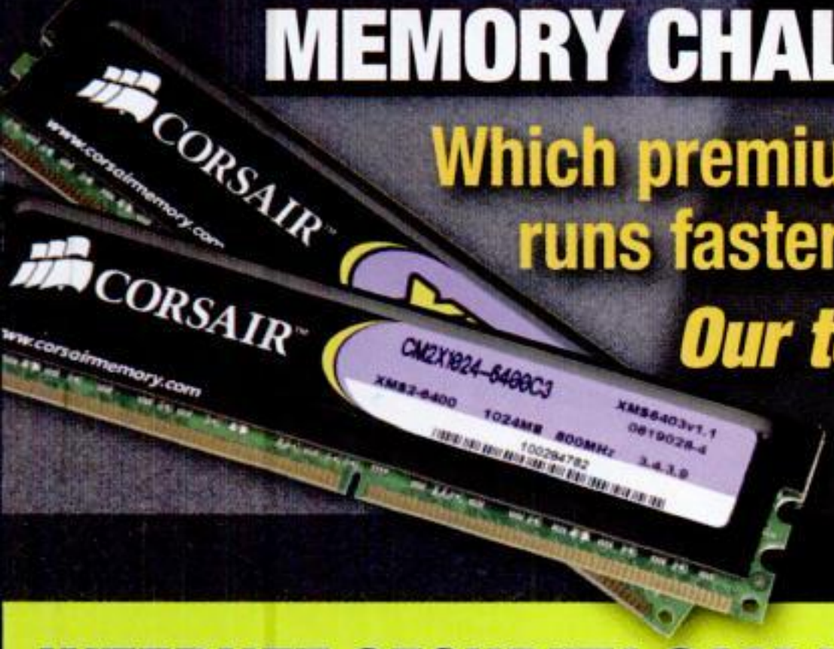

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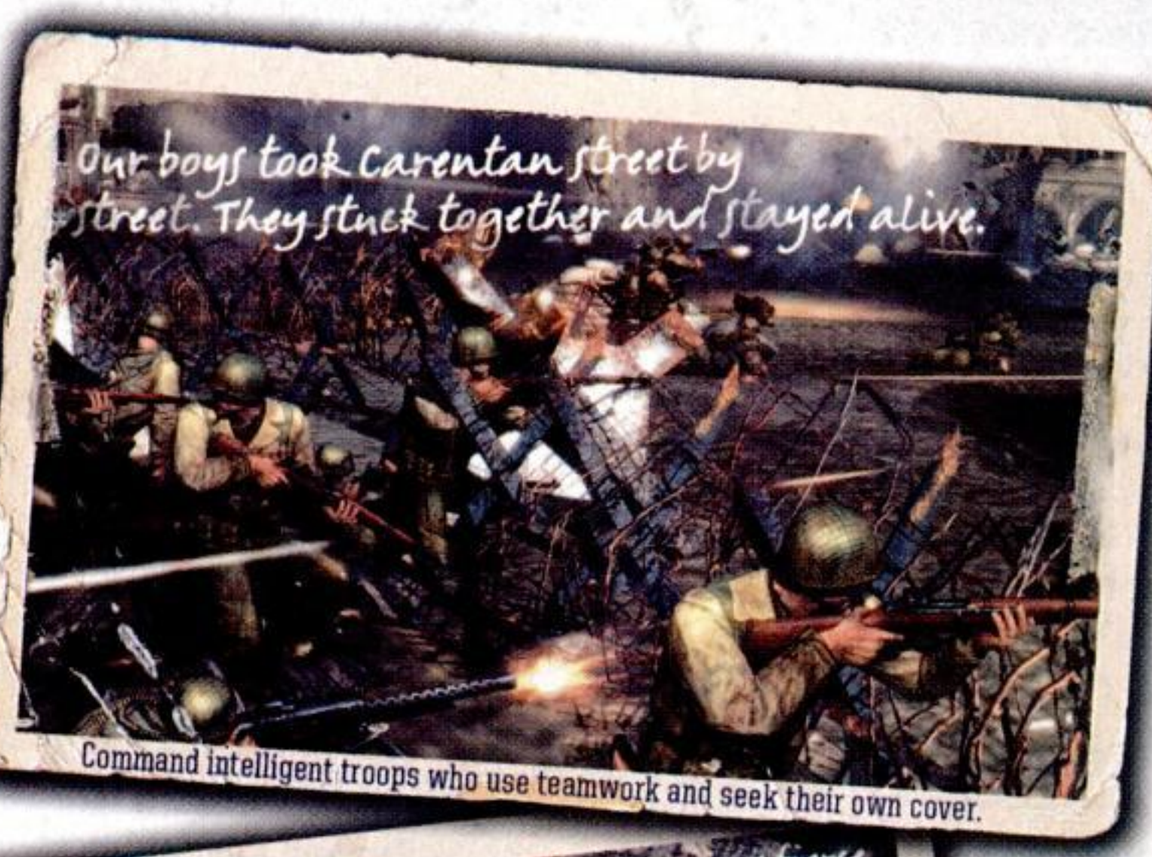

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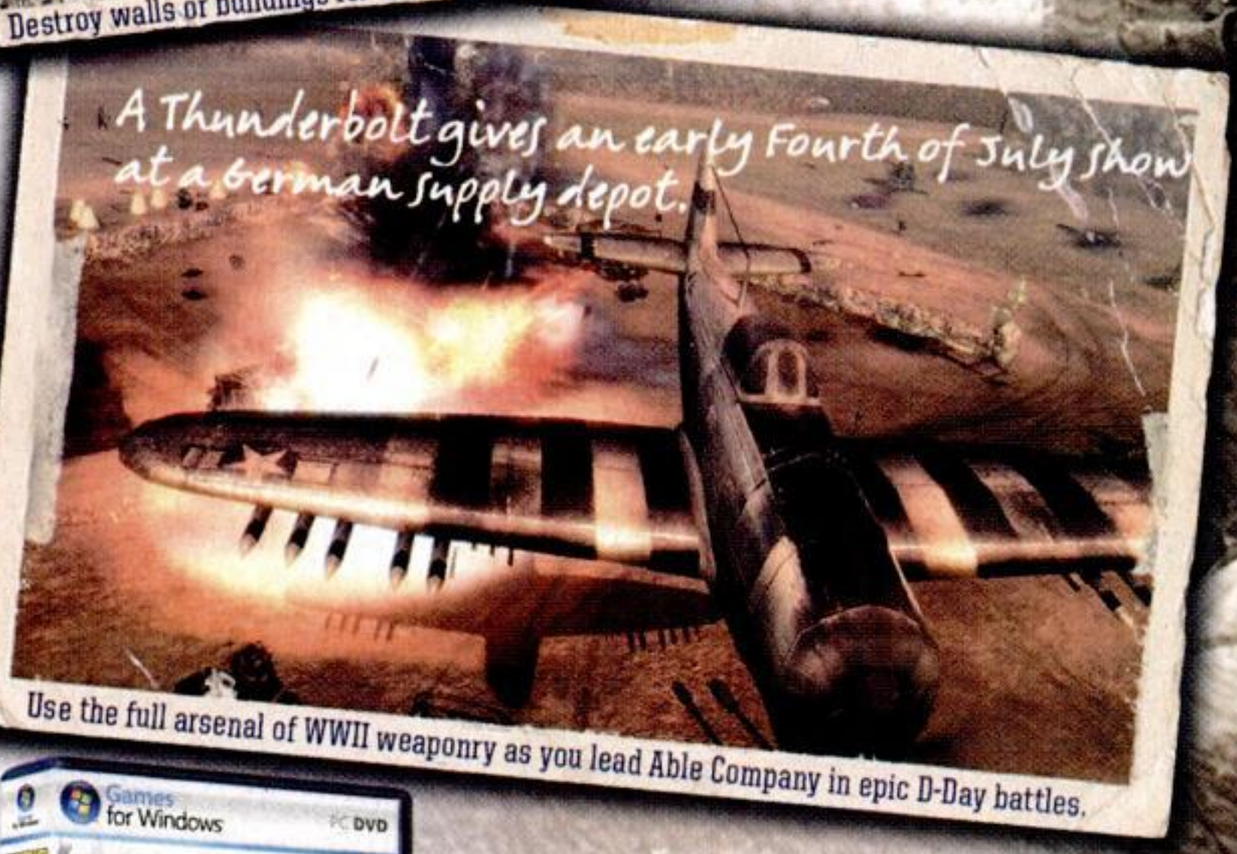

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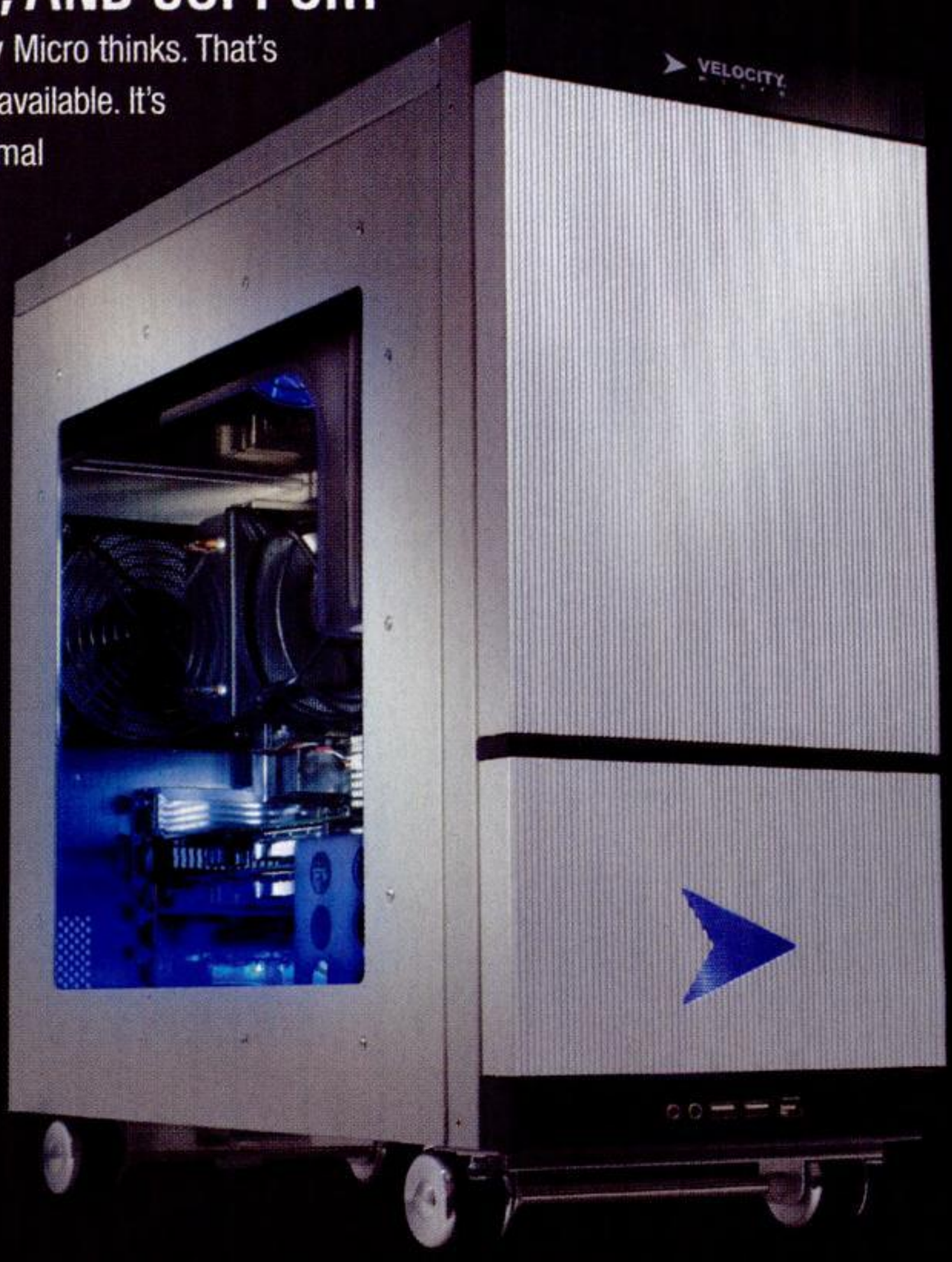

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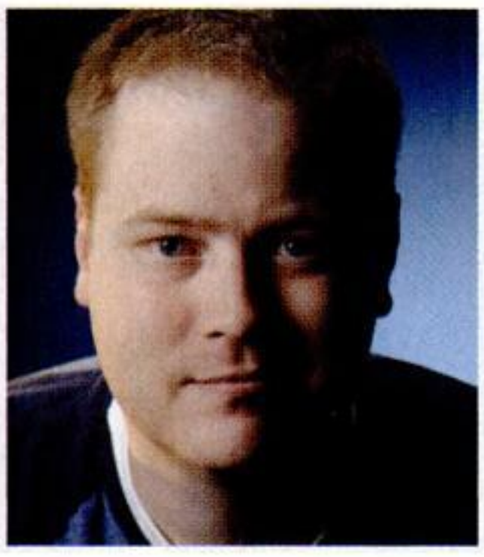
Ed Word



Education is Job #1

Please send feedback and caramel apples to ***will@maximumpc.com.***

The news is bleak these days—at least for mediaphiles. Sometimes it seems like there's nothing we can do, but don't lose hope yet!

To recap: Blu-ray and HD-DVD are mired in content "protection" debacles that screw the consumers. (You guys *are* beating down Sony's door to buy its Blu-ray drive that can't play Blu-ray movies, right?) And HD-DVD isn't any better. It's unlikely that either format will even work in the 32-bit version of Vista—you know, the only one you can get printer drivers for.

The HDTV situation is worse. Sure, we won the Broadcast Flag battle, but we've lost the HDTV war. How many of you actually watch over-the-air broadcasts? If you're lucky enough to have HD service, it's probably piped into your home via cable or satellite. There's absolutely no way to get that HD signal into any device that doesn't come from your provider. The much-delayed CableCard should theoretically allow users to access encrypted HD content using CableCard-compatible devices, except for one problem: PC CableCard adapters will only be available to consumers who buy PCs from large OEMs such as Dell, HP, and Gateway. Small screwdriver shops and home builders are SOL.

Why is that? The great big content-creation corporations are afraid of us. They're afraid that if we get access to their "highly secure" CableCard technology, we'll manage to hax0r it and steal their content. They're afraid that instead of buying new *Momma's Family* DVDs, we'll just "steal" the content from our HD PVRs or share the content on file-sharing networks.

Forgotten in the rush to "protect" content are the consumers. When all the encumbering technology is in place, we won't be able to rip content for playback on our portable devices, in our cars, or in any other media player. This is functionality that's being taken away in the move to high-def content. I wouldn't be able to watch DVD rips of my movies on my PSP or listen to MP3s on my iPod without it. Hell, I wouldn't have even been able to make that mix tape I gave to my 7th grade sweetheart.

In order to stop the madness, I need you to help. You need to go out and educate all of your friends about the perils of the new technology. Whether it's the DRM embedded in iTunes Music Store tracks, the broken next-gen optical formats, or the CableCard, these broken products do not deserve our hard-earned cash. The only way we're going to get the changes we want is if no one buys into the bull.

Will Smith

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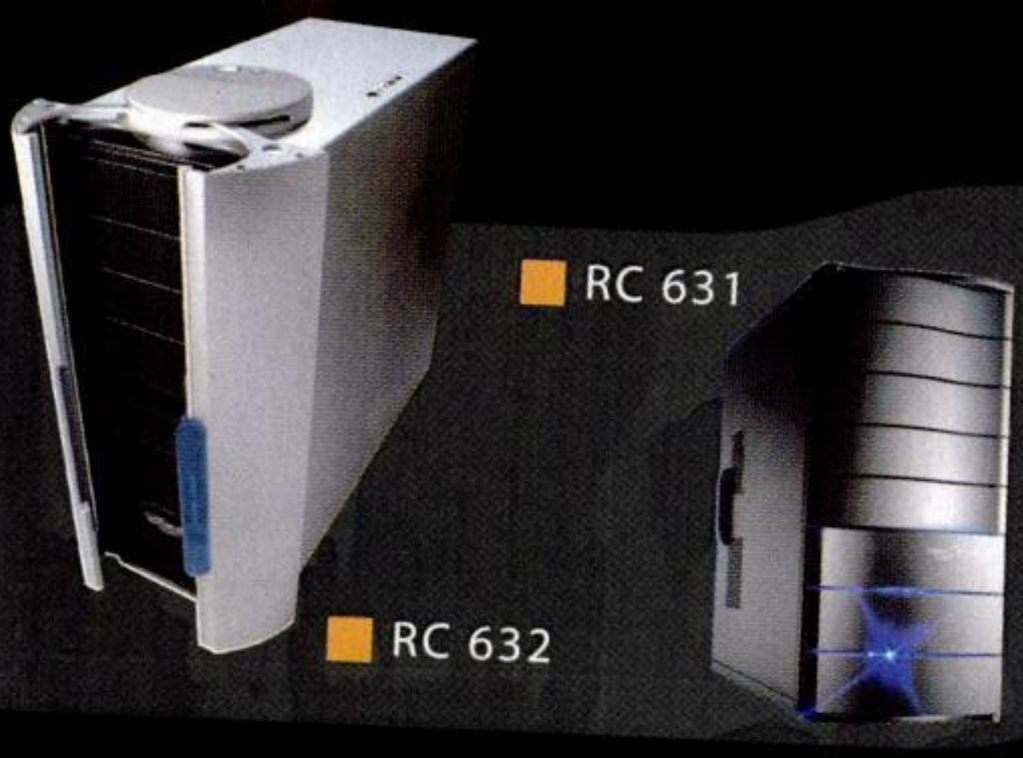

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CONTRIBUTING WRITERS **Norman Chan, Gord Goble, Tom Halfhill, Paul Lilly, Thomas McDonald**
EDITOR EMERITUS **Andrew Sanchez**

ART
ART DIRECTOR **Natalie Jeday**
ASSOCIATE ART DIRECTOR **Boni Uzilevsky**
PHOTO EDITOR **Mark Madeo**
ASSOCIATE PHOTOGRAPHER **Samantha Berg**
CONTRIBUTING PHOTOGRAPHER **Sandra Silbereisen**
CONTRIBUTING ARTISTS **Martin Able, Steve Keller**

BUSINESS
ASSOCIATE PUBLISHER **Anthony Danzi**
646-723-5453, adanzi@futureus-inc.com
SOUTH WESTERN AD DIRECTOR **Dave Lynn**
949-360-4443, dlynn@futureus-inc.com
NATIONAL SALES MANAGER, ENTERTAINMENT **Isaac Ugay**
714-381-3419, iugay@futureus-inc.com
NORTH WESTERN AD DIRECTOR **Stacey Levy**
925-964-1205, slevy@futureus-inc.com
EASTERN AD MANAGER **Larry Presser**
646-723-5459, lpresser@futureus-inc.com
ADVERTISING COORDINATOR **Jose Urrutia**
650-238-2498, jurrutia@futureus-inc.com
MARKETING MANAGER **Cassandra Magzamen**
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PRODUCTION
PRODUCTION DIRECTOR **Richie Lesovoy**
PRODUCTION COORDINATOR **Dan Mallory**

CIRCULATION
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FUTURE plc
30 Monmouth St., Bath, Avon, BA1 2BW, England
www.futureplc.com
Tel +44 1225 442244

NON-EXECUTIVE CHAIRMAN: **Roger Parry**
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GROUP FINANCE DIRECTOR: **John Bowman**
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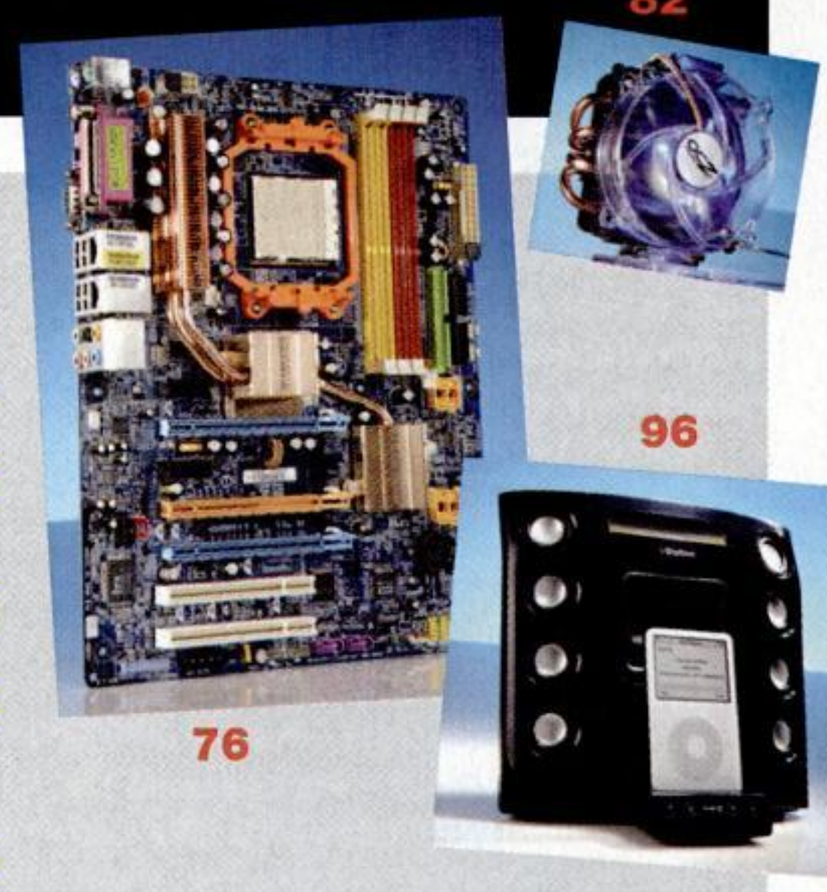

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Why Are GPUs So Damn Hot?

ATI and nVidia take heat over scalding parts

Surely there were a few kids at your high school who didn't get the memo that acid-washed jeans and asymmetrical haircuts were out. Now think of ATI and nVidia as those kids—a pair totally unaware of the latest trend in computing: it's cool to be cool.

Just look at AMD and Intel. Both companies are trumpeting better "performance per watt" at every opportunity. Not so with ATI and nVidia, whose next-generation parts will require more power and produce more heat.

But whose fault is it? Are ATI and nVidia rebels without a clue or are they rebels who can't be understood? Analyst Jon Peddie, with the *Peddie Report*, says the two are just victims of circumstance.

Fire up a game and listen as the GPU's fans spool up, Peddie says, while the CPU fan rarely reaches full speed—that's because the workload is mostly handled by the GPU today.

"ATI and nVidia are not being casual or cavalier at all about thermals," Peddie says; both companies actually put more thought into thermals than the CPU companies do, because graphics cards are confined to the small expansion slots.

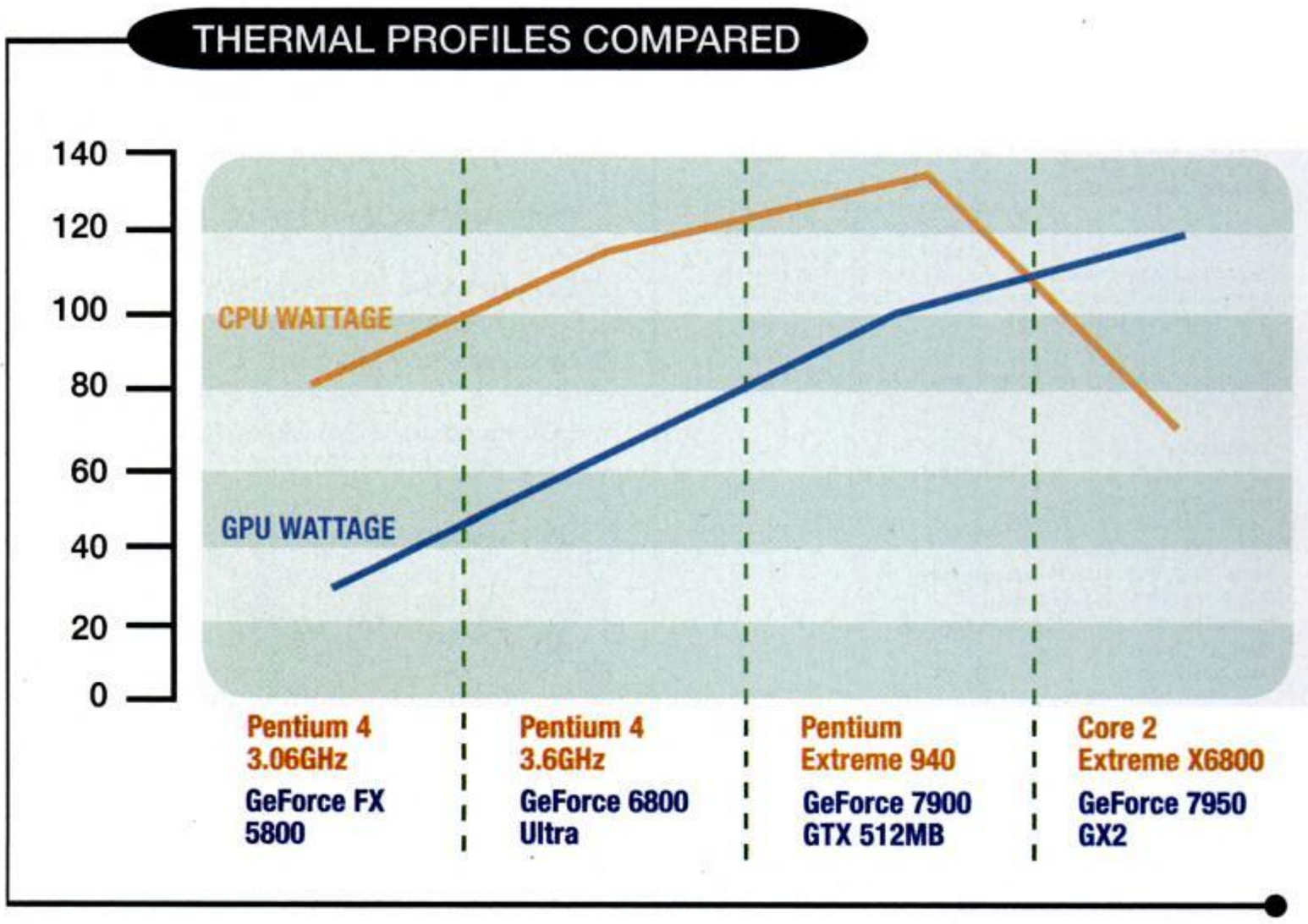
Raja Koduri, director of engineering at ATI, agrees. He says people who think graphics companies just don't care about thermals and power are mistaken. Koduri says part of the problem is inherent to the way graphics work.

"The number of compute units we have that all get utilized, compared to a CPU, is far more," Koduri says. While a modern CPU with clock gating can turn off cache or execution units in many applications, graphics are far more parallel, which means fewer sections can be switched off. Koduri also says that graphics companies work on more parts per year, with each designed for different tastes, and that performance users just don't seem to mind the heat and power requirements. But that doesn't mean ATI isn't paying attention. The company expects a forthcoming die-shrink to make a difference, and ATI is putting more emphasis on thermals and power consumption in performance parts. nVidia's Tony Tomasi adds that GPU companies are being blamed unfairly, especially when you consider the performance factor. "GPUs tend to do a lot of computing in the hundreds of gigaflops and teraflops," Tomasi says. "CPU performance is measured in the tens of gigaflops. If you look at it in gigaflops per watt, I think you'll find that GPUs are hugely more efficient than CPUs."

Tomasi says nVidia's current products are actually more efficient than its competition, and credits the disastrous GeForce FX series for the more efficient design. The way graphics-card designs are going, however, don't be surprised if you need a one-kilowatt power supply for a quad-GPU rig. Shrinking processes will help, but architecture changes can also make a big difference. Tomasi cites Intel's change from the Pentium D to the Core 2 Duo as an example. Both products were on the same 65nm process but the Core 2 Duos yield far better performance, with less heat. Tomasi also says a consumer-level version of its external graphics Quadro Plex could become necessary one day.

nVidia's external Quadro Plex graphic unit for workstations could find its way to consumer desktops one day, if heat and power requirements continue to increase unabated.

No matter what, according to Tomasi, we are approaching a wall, as the average American home puts out only 120 volts with 10 to 15 amps at the socket. That translates to about 1,200 to 1,800 watts. If the power consumption mess isn't sorted out soon, the only other option will be for consumers to move their PCs to the basement to sit alongside the washer and dryer—and their handy 220-volt outlets.



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Native OpenGL Support in Vista

If you thought the 3D-rendering API OpenGL was dead and buried, think again. The group responsible for maintaining the standard recently announced that not only would OpenGL be supported natively in the upcoming Microsoft Vista operating system, but that it would also run faster than Microsoft's very own 3D API—Direct3D.

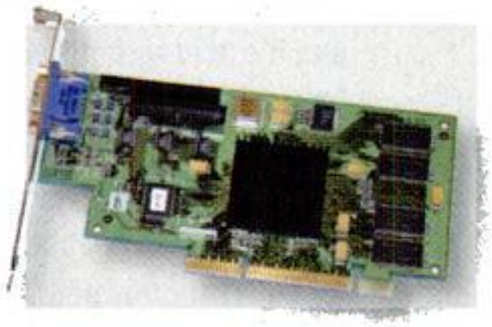
This news should come as a shock to fans of OpenGL. Once the most-favored API in the land, thanks to support from a wide array of game developers, OpenGL's popularity among gamers has lately been eclipsed by Direct3D. And because Microsoft has been behind the push to make Direct3D the de facto API for 3D rendering, it's especially surprising to learn of the level of support the standard will receive in Microsoft's next OS.

Previously, Microsoft had said that OpenGL would work in Vista, but that it would only run on top of Direct3D, which would involve a performance hit. Recently, however, the Khronos Group, which is responsible for the standard, sent a big shout-out to Microsoft for including native support for OpenGL. In other words, it will not run as a "hardware overlay" on Direct3D.

Of course, you'll need a specific driver to run OpenGL, and it won't ship on the Vista CD. The good news is that nVidia and ATI are both working on these drivers, and they should have beta versions ready very shortly. WHQL-compliant drivers should be ready by the time Vista actually ships.

Rumor Mill: Intel to Build Discrete Graphics—Again?

Rumors are swirling that Intel has embarked on a major initiative to re-enter the discrete videocard business. It makes sense: Vista's coming, and arch-rival AMD is busily digesting ATI. On the other hand, all of Intel's previous efforts in this area have fizzled. Maybe that's why the company doesn't want to talk GPUs right now.



Intel would love to build a badass GPU to partner with Conroe, but this old i740 board isn't it.

Introducing Asusabyte?

In a sign that the motherboard industry shakeout hasn't ended, Gigabyte has entered into a "strategic alliance" with Asus to help prop up its flagging business.

Both mobo manufacturers pledge to continue to produce and market separate products as competitors, but industry insiders say the deal will likely end up with Gigabyte tapping Asus to assemble its motherboards and graphics cards.

Gigabyte made the announcement in a rather dour statement, which highlights the tough times small vendors have fallen on as they try to compete with companies who hold contracts with large PC makers. As the PC OEMs have grown in size, they've squeezed out smaller white-box and enthusiast vendors, such as Gigabyte and Abit.

Earlier this year, Abit announced a similar "strategic partnership" with Universal Scientific Industrial that effectively ended with Abit outsourcing large portions of its business to USI and ECS, another mobo maker.

SanDisk Gobbles M-Systems

The world's largest flash-memory maker, SanDisk, has (tentatively) purchased the world's largest flash-memory logic producer, M-Systems, for $1.5 billion in stock. The deal creates a flash-memory monolith and continues the trend of consolidation in the flash market. The deal might not go through, however. As we went to press, the acquisition was being challenged by M-System shareholders.

FAST FORWARD

TOM **HALFHILL**

The Future of PC Graphics

AMD's $5.4 billion acquisition of graphics vendor ATI is a brash gamble that dramatically changes the competitive landscape with Intel. AMD is stretching itself financially at a time when Intel is fighting back with highly competitive new PC processors. Can AMD maintain its momentum in processors while absorbing ATI and expanding the battlefront to PC graphics and chipsets?

It's a lot to expect from a company once famous for screwing up. AMD's turn-around has been remarkable, but now the company must execute its plans flawlessly to avoid blowback.

One way in which AMD has outmaneuvered Intel is higher integration. AMD's Direct Connect Architecture integrates the memory controller on the CPU chip. It's logical to assume that AMD will soon integrate ATI graphics on chip, too, at least in some PC processors. However, other companies, including Intel, have tried this before—with disappointing results.

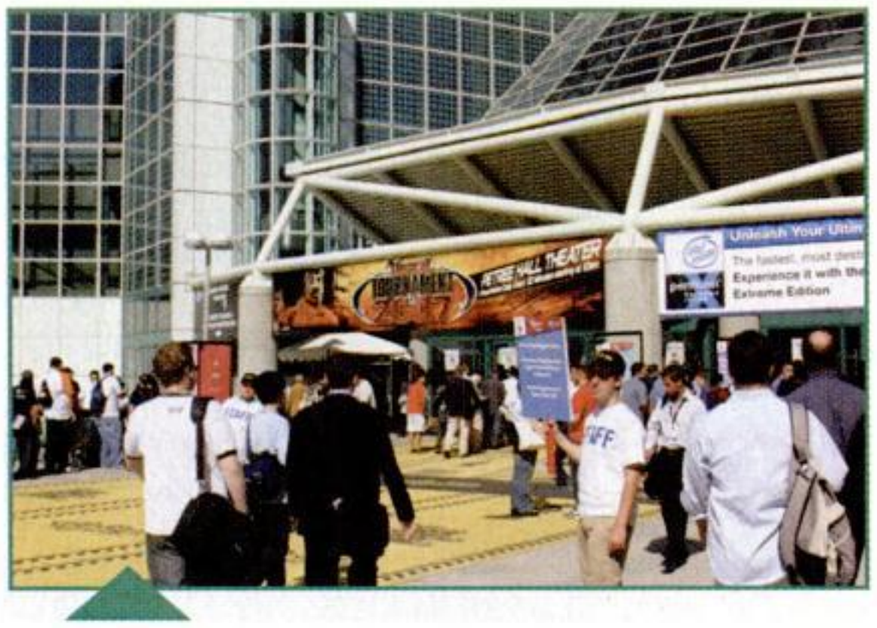
In theory, integrating a GPU with a CPU should radically boost performance, because their mutual I/O interfaces can run much faster. In practice, there are several drawbacks to integration. One is that users can't upgrade an integrated GPU without also swapping the CPU. For most PC users, it won't matter, because they rarely upgrade the graphics, anyway. But power users upgrade frequently, and they like the freedom of pairing the fastest CPUs and GPUs, even if they're from different vendors.

Another problem with integrated graphics is keeping the whole processor state-of-the-art. After the CPU and GPU development teams finish their halves of the design, they must join the pieces together in a single-chip layout. By the time the integration is finished, graphics technology (and perhaps CPU technology, as well) may have advanced so much that the "new" design is obsolete. That's one reason why existing system chipsets with integrated GPUs are intended for "business graphics," not for cutting-edge game graphics.

Of course, another drawback of higher integration is die-size bloat. Today's best GPUs are as complex and large as the best CPUs. In addition, the CPU portion of the integrated design will likely have multiple cores. The larger chips get, the more difficult and costly they are to manufacture.

AMD will probably offer PC processors with integrated ATI graphics. However, I expect serious gamers will continue using discrete graphics cards for several years, until AMD (or Intel) solves the integration problems.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.



E3 2006 was the last full-scale geek onslaught on the Los Angeles Convention Center, and we were there!

E3 Gets Downsized

E3, the popular electronic gaming expo, is being downsized for 2007, from an all-access gamer orgy to a tranquil, invite-only event. The move is in reaction to spiraling costs, with some publishers spending tens of millions of dollars to exhibit. The news hit Best Buy and GameStop employees the hardest, as they will no longer be admitted.

Holographic Storage to Ship Soon?

Massive storage might be on the horizon, but don't hold your breath

Holographic storage? Do you use it on your holodeck? No, you don't. You use it to store massive quantities of data, and according to Hitachi-Maxell, it'll be arriving this year.

Now, before you get all excited, you should know the cost. The media, which will first appear as a 300GB holographic disc, will cost about $150. And the holographic drive itself? A cool $15K. Don't fret: It's not for consumers yet. Initially it'll be used strictly for archiving by defense and broadcasting companies. When it's ready for mass consumption in several years, capacities will have skyrocketed. Hitachi says it has a 1.6 terabyte disc penciled in for 2010.

Holographic media resembles a DVD-RAM disc, and will initially offer 300GB capacity.

Flash Comes to Vista

There's been a lot of talk about the way Windows Vista will be able to take advantage of flash memory to speed up boot time and file access, but details have been murky. We sat down with Samsung—maker of the popular NAND flash modules—to sort it out once and for all. As it turns out, there are four different ways flash memory can be used in Vista.

► INTEL'S ROBSON TECH:
Intel plans to add flash memory directly onto the motherboard and have it communicate with the system across the PCI Express bus. It might be a permanent module or an upgradable memory socket, but the memory will primarily act as prefetch, storing frequently accessed files, even across several boots.

► HYBRID HARD DRIVE:
Laptops will soon ship with "hybrid" hard drives, which combine flash memory with traditional magnetic platters. The flash stores all data to be written to the drive, while the hard drive remains spun down. When the flash gets full, the hard drives spin up to receive the contents of the flash drive. Then the process starts anew.

► USB FLASH DRIVE:
If you insert a USB flash drive into a Vista machine, you will be able to use it as a prefetch device via Vista's ReadyBoost technology. Vista will load files needed by your most-accessed programs onto the key to allow faster access.

► SOLID STATE DRIVES:
Vista's ReadyBoost technology will also work with solid-state hard drives, either as the boot drive or as auxiliary cache. The drive will be able to read/write and prefetch data.

FUNSIZENEWS

NASA TAKES ON GOOGLE EARTH

NASA's new app, World Wind, will look mighty familiar to Google Earth users. However, instead of using the low-resolution satellite images Google purchased on the free market, World Wind's imagery comes from NASA's satellites, and includes complete maps of the Earth, the moon, and Mars. Plus, you can even overlay current weather conditions and cloud positions. Get it at **http://worldwind.arc.nasa.gov**

FREE VISTA UPGRADES FOR IMPATIENT PEOPLE

If you need a new pre-fab PC, but want to wait for Vista, Microsoft feels your pain. That's why, starting in October, OEMs will begin including coupons for a free Vista upgrade to people who buy a Vista-ready PC with Windows XP on it. Though we're not fans of pre-fab rigs, we'll admit this is a pretty sweet deal.

CORSAIR BAKES A PSU

Corsair is wading into the hotly contested power-supply market. Dubbed the HX series, Corsair is offering 520W and 620W models, and both include dual PCI Express connectors for running SLI or CrossFire. The PSUs are modular, use sleeved cables, and sport 12cm cooling fans.

RAMBUS SLAPPED WITH FINES

Rambus—the memory company everyone loves to hate—was dealt a major smackdown by top U.S. business regulators recently, when they found the company to have unlawfully monopolized four memory markets. The ruling says Rambus' practice of suing competing memory companies, claiming patent violations, amounted to a "hold-up" of the DRAM memory industry.

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GAME THEORY

THOMAS MCDONALD

E3: Dead Already

Someone has finally put a bullet in the brain pan of the lurching, mind-sucking zombie that is/was E3. The Entertainment Software Association (ESA), which runs E3, says its ex-trade show has "evolved" into a "more intimate event focused on targeted, personalized meetings and activities," much in the way the woolly mammoth has "evolved" out of its need to scratch around in the Pleistocene tundra looking for fern blossoms. They make it sound like E3 has moved into some higher plane of existence. It's not dead, it's just pining for the fjords.

In truth, the point of lavish, insider-only trade-show extravaganzas in a broadband culture is becoming increasingly hard to find. Webzines, blogs, email, IM, online video and demos, pod-casts, and dedicated cable networks keep the information stream flowing 24/7/365. E3 was a relic of an earlier age, when men in suits gathered once a year to look at the new line of Consolidated Widgets and get a few days away from the fam-ily. It grew out of CES (the Consumer Electronics Show), an annual Vegas freak show that enabled men to walk a straight line through displays of new stereos and TVs, check out the latest porno videos and stars, eat a hearty buffet, drink them-selves stupid, and then gamble.

E3, on the other hand, lodged itself in Los Angeles (rumored to actually be the 7th Circle of Hell) like a particularly stubborn tick, and lacked all the seedy, madcap appeal of Vegas CES. It became a loud, over-produced extravaganza, with booths doggedly vying for the Loudest Obnoxious Music Award, multilevel displays that would shame a World Fair, pneumatic bimbots unable to answer the simplest questions ("what – is – the – game – *called?*"), unwashed fan-journos refusing to give up the demo, compulsive queuing for crap nobody even wants, and endless walking.

Trade shows are expensive, time-sucking distractions, forcing companies to dedicate vast chunks of money and manpower for a nebulous payoff. Someone finally realized: "Wait a minute: We're spending millions of dollars to get the atten-tion of *journalists?* We can do that with a plane ticket, a lap dance, and a bottle of Stoli."

At least, that's what I've been trying to tell them for years.

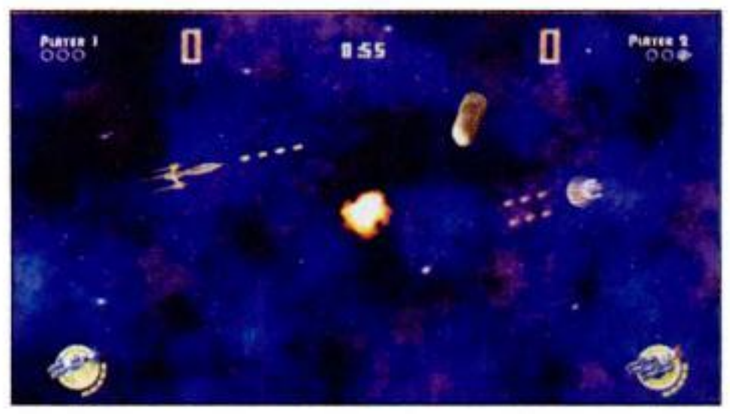
Tom McDonald has been covering games for countless maga-zines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Make Your Own Game with XNA

Microsoft releases game-development tools for Windows and Xbox 360

Merely getting the tools to build your first game—whether it's a bleed-ing-edge first-person shooter or an addictive puzzle fest—costs a bundle. Even the most basic version of Microsoft's coding environment, *Visual Studio,* retails for $300, and that's cheap compared with tools like *Photoshop* and *Maya*.

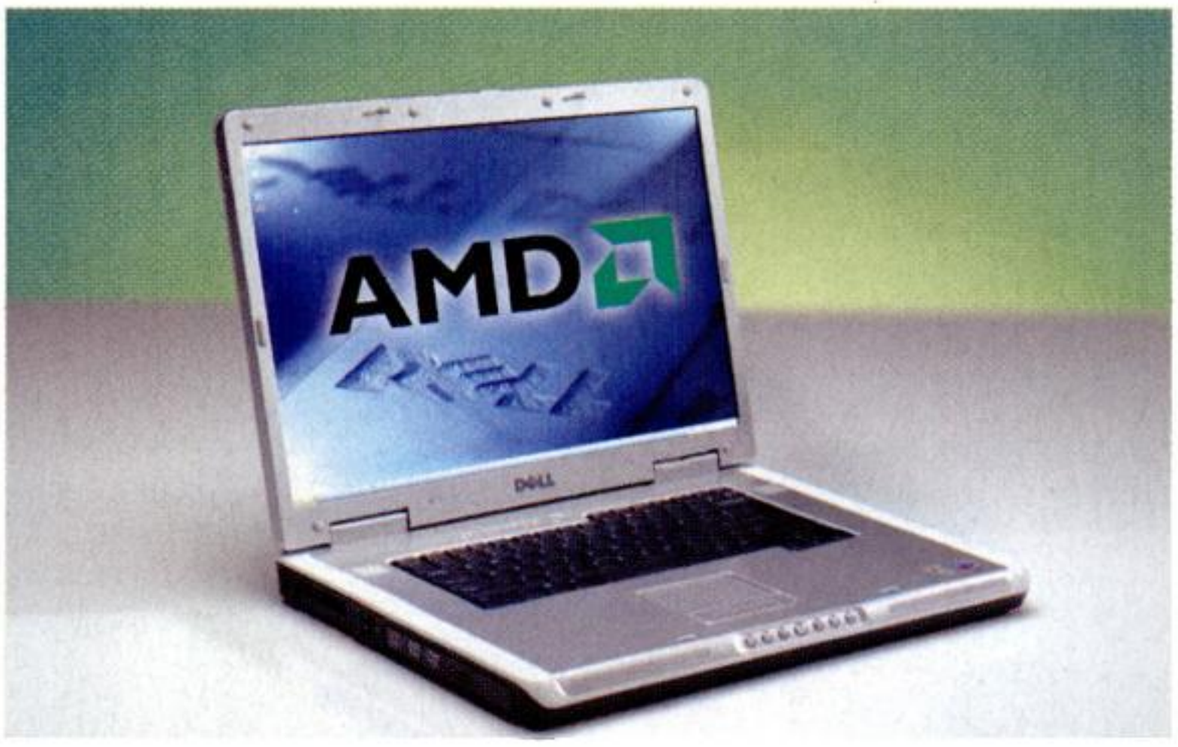
Enter Microsoft's new XNA platform. In an effort to boost inter-est in Computer Science degrees, as well as lure fresh blood into the gaming industry, Microsoft is releasing its game-programming starter kit—dubbed *XNA Game Studio Express*—free to the general public. Express will come with everything you need to write your own games, com-pile them, and run them on a PC or an Xbox 360. The beta will be available at **www.microsoft.com** on August 30, so get cracking!



***XNA Game Studio Express* will include sample source code, so you can see how games like SpaceWars (above) were made.**

Dell Takes the AMD Plunge, for Real this Time

Finally, after years of rumors, Dell has pulled the trigger and ordered enough parts for more than a million AMD-based desk-tops and around 800K laptops. We're not sure why Dell waited until now, but we'd bet it has something to do with AMD's CPU fire sale.



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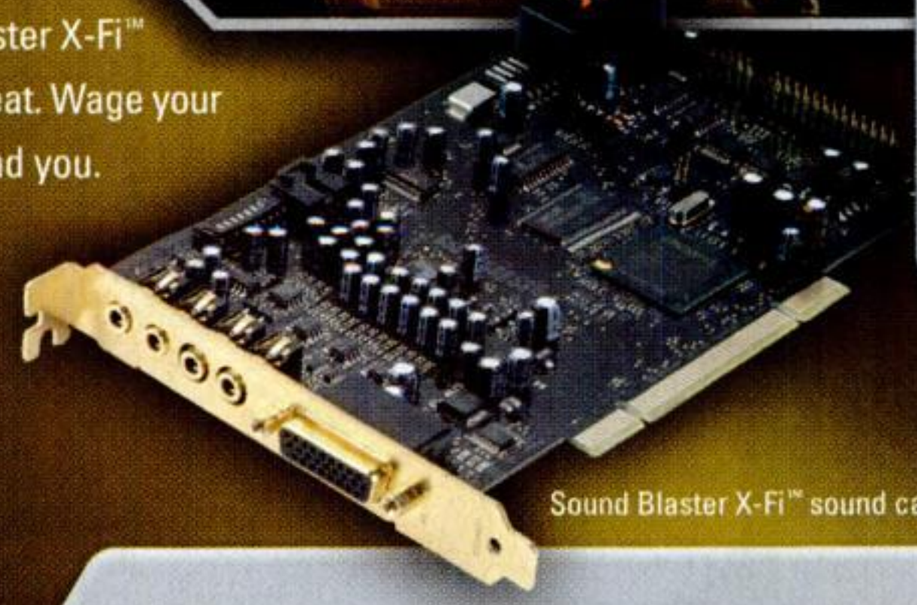

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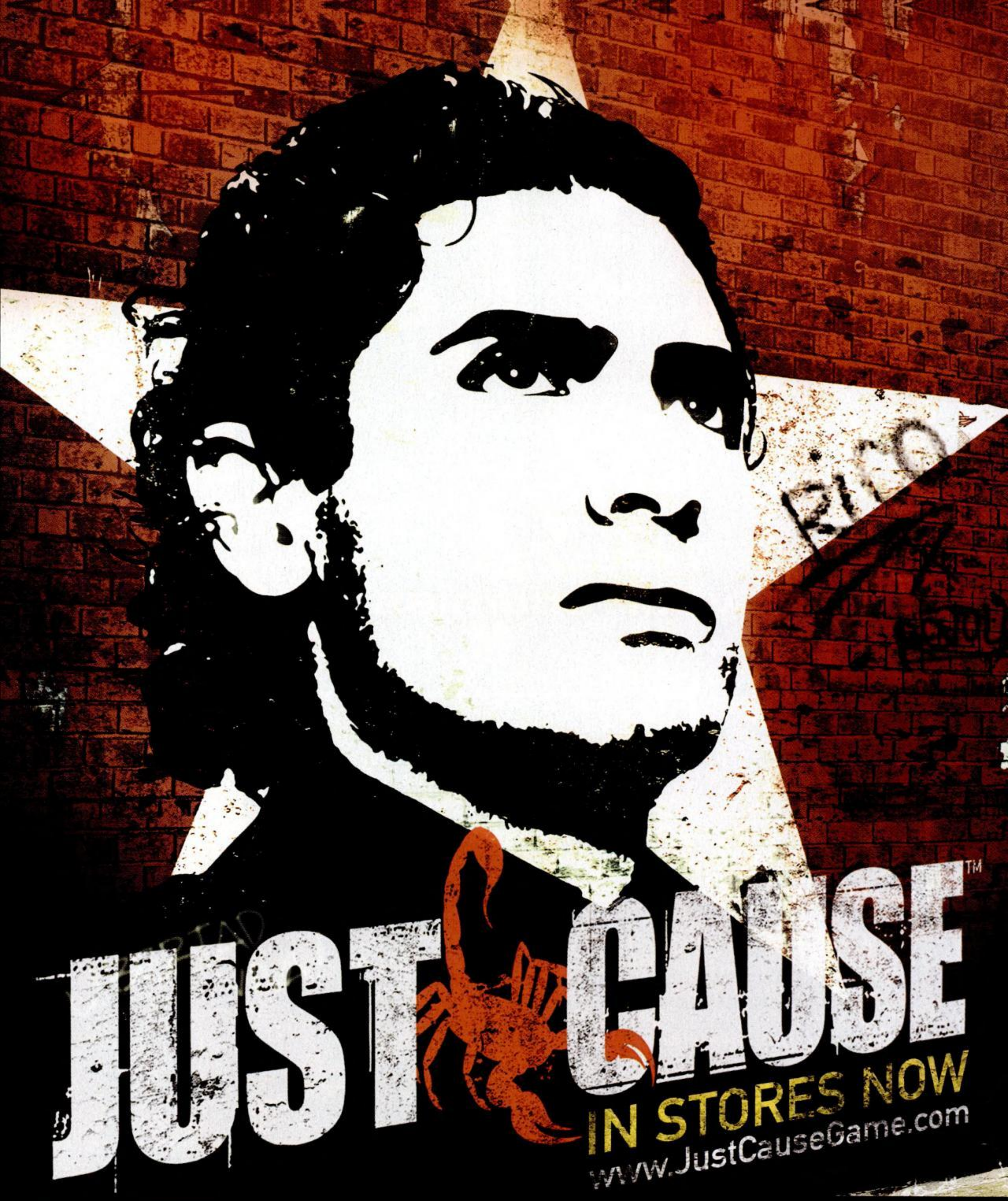

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The way it's meant to be played NVIDIA

SOUNDS BEST ON Sound BLASTER X-Fi TECHNOLOGY

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Headset **vs.** Headphones

Many of us use our computer and Internet connection for two-way verbal communication, so it should come as no surprise that USB headsets have become popular PC accessories. Whether it be VoIP sessions with friends, family, or even customers; or strategizing with teammates—and taunting enemies—during online gaming bouts, these headphone/microphone combos are extremely useful.

But we crave high-quality audio, so we've been wondering if we're making too many sonic compromises in the name of convenience. Because we use them for gaming and music listening, any headset worth considering must have stereo earphones. But are these jacks of all trades masters of none? Which delivers a better price/performance ratio: A moderately priced stereo headset or a moderately priced set of conventional headphones paired with an inexpensive lapel mic?

To find out, we conducted a series of A/B speaking, listening, and recording tests between one of the better USB headsets on the market: Plantronics' Audio 550 DSP, and one of the better sets of headphones currently available: Sennheiser's HD555 paired with an inexpensive lapel mic: Radio Shack's model 33-3013.

BY MICHAEL **BROWN**

SENNHEISER HD555 HEADPHONES
$170, www.sennheiserusa.com

RADIO SHACK MODEL 33-3013 LAPEL MIC
$26, www.radioshack.com

round 1 CONVENIENCE

Let's tackle this one first, because it's the number-one reason people choose a headset in the first place—and it's no wonder. By definition, a stereo headset integrates stereo headphones and a microphone, one that's typically mounted on an adjustable boom. Most headsets plug into a USB port, so there's only one cable to deal with.

The headphone/microphone combo not only leaves you with two cables that must be plugged into your soundcard or onboard audio, but then you also have to figure out where you're going to attach the mic. Lapel mics can be clipped to your clothing, but we kept forgetting to detach the little bugger when we left our desk. And most lapel mics rely on battery power, which means you can't forget to turn them off when you're not using them. **WINNER: USB HEADSET**

round 2 COMFORT

Most headsets are designed to rest on top of your ear, so as not to isolate you from external sounds, such as a ringing telephone. But leave anything sitting on your ears for an extended length of time and your ears are bound to become sore; ours certainly did after long stretches of gaming while wearing the Plantronics Audio 550 DSP.

Although this can't be said of *all* headphones, the Sennheiser HD555's muffs are designed to rest on the sides of your head, cupping each of your ears entirely without making contact with any part of them. We listened to these headphones for hours without experiencing fatigue or irritation. **WINNER: HEADPHONES/ LAPEL MIC**

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round 3

HEADPHONE AUDIO QUALITY

We used game and movie soundtracks, voice recordings, CDs, and high bit-rate WMAs and MP3s to judge this category. The Plantronics headset sounded pretty good—until we switched over to the Sennheiser set and our brain began lapping up all the sonic nuances that the USB audio system proved incapable of delivering.

The Sennheiser headphones were light years beyond the Plantronics headset when it came to reproducing the unique timbres of individual instruments. We became acutely aware of this doing A/B listening tests with Zakir Hussain's "Tal-Posta in 5 Beats." With the Plantronics, Hussain's brilliant work on the tabla sounded dull and lifeless. With the Sennhieser, it sounded as though he was slapping the wetware inside our skull. And when you use a USB headset, you lose all the signal-processing benefits that a good soundcard can provide.

WINNER: HEADPHONES/ LAPEL MIC

round 4

MICROPHONE AUDIO QUALITY

We were hoping this would be a closer contest, but the mic integrated into the Plantronics headset blew away the Radio Shack lapel mic. Part of the problem is the lapel mic's omnidirectional nature: Because it's not in close proximity to your mouth, it's designed to pick up sound from all directions. This meant it detected not only our voice, but also ambient noise from the room—including the loud whine of our desktop PC's cooling fan.

The Plantronics mic is mounted on a flexible, telescopic boom that extends out from the headset. It's highly directional, because you position it right in front of your mouth. It's also outfitted with noise-cancellation technology, to reject sounds outside the frequency spectrum of the typical human voice.

WINNER: HEADSET

round 5

PRICE/PERFORMANCE RATIO

This is a tough category to judge. The headset is by far the cheaper solution, as it bundles a headphone and a mic into a package with a street price that's less than half that of a headphone paired with a lapel mic. And the Plantronics Audio 550 DSP doesn't sound half bad. But if you've upgraded to a high-end soundcard, such as Creative's luscious X-Fi, you're wasting that investment by using a USB headset—the headset will bypass all the powerful effects and signal processing that card has to offer.

WINNER: HEADPHONES/LAPEL MIC

PLANTRONICS AUDIO 550 DSP HEADSET
$120, www.plantronics.com

And the Winner Is...

You spend hours at your PC for both work and recreation. You've spent good money on a powerful videocard. You've spilt more than a few beans on a big monitor. Why deny yourself the best-quality audio experience you can afford?

Good headphones are more comfortable to wear, and they're a joy to listen to. They also make the best use of your PC's sound system. We'll admit the lapel mic is a bit of a pain to clip on and take off, and the battery won't last long if you forget to shut it down, but it won't impact your user experience. The person on the receiving end, meanwhile, is unlikely to notice the difference.

You'll appreciate a set of good headphones almost every time you use your PC; you'll appreciate a good headset only while you're playing an online game that relies on voice chat. If you constantly find yourself using a mic with your PC, and you have the budget, we'd recommend buying both a headset and a pair of headphones—forget about the lapel mic. If it's to be one or the other, however, we'd make the compromise on the outgoing-audio side of the equation: Buy a set of quality headphones and an inexpensive lapel mic. MPC

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XPS
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XPS 700

XPS M1710

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– Anandtech.com, July 14, 2006

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†**PLEASE NOTE:** This Build Your Own series is specifically designed for those computer enthusiasts who enjoy building their own computers. To cater to this customer, these bundles require hardware additions to build a complete system and include a one-year Parts Only Type 6 Service Contract, found here: www.dell.com/downloads/global/services/con_hardwareServiceAgreement_dhs.pdf. These are NOT functioning systems. No operating system other than FreeDOS is included.

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Our consumer advocate investigates...

✓Vaporware ✓RAM Warranties ✓Battery Recalls for Dell & Apple

Kelly, watchdog of the month

HIGH-PERFORMANCE VAPORWARE

I'm irked at the increasing amount of product that gets announced without actually being released for sale. Five products immediately come to mind and all would be ideal additions to my dream PC:

***1)** Asus EN7800GT TOP Silent videocard— the best fanless videocard.*

***2)** Asrock ConRoe945G-DVI motherboard—one of only two "currently available" mATX boards that specifically work with Core 2 Duo CPUs.*

***3)** Asrock 775Twins-HDTV R2.0 motherboard—the other one of only two "currently available" mATX boards that specifically work with the C2D. This one has the added bonus of running C2D with DDR memory.*

***4)** Intel Core 2 Duo E6600 CP— the "entry-level" 4MB cache Conroe CPU.*

***5)** Samsung HM160JI hard drive— the largest and quietest SATA notebook HD you can buy, if you can find one.*

In all of these cases, the manufacturer's website lists the product as released, and there are many reviews of these products from reputable sources, yet I can't find any of the items on this list in stock at any retailer. Am I just unlucky enough to gravitate toward rare products? Or are manufacturers getting more and more addicted to the "fake launch"?

— Brian Voykin

The Dog hears you: Plenty of "announced" products never make it into consumers' hands. The Dog checked with the vendors of the five products you mentioned and learned the following:

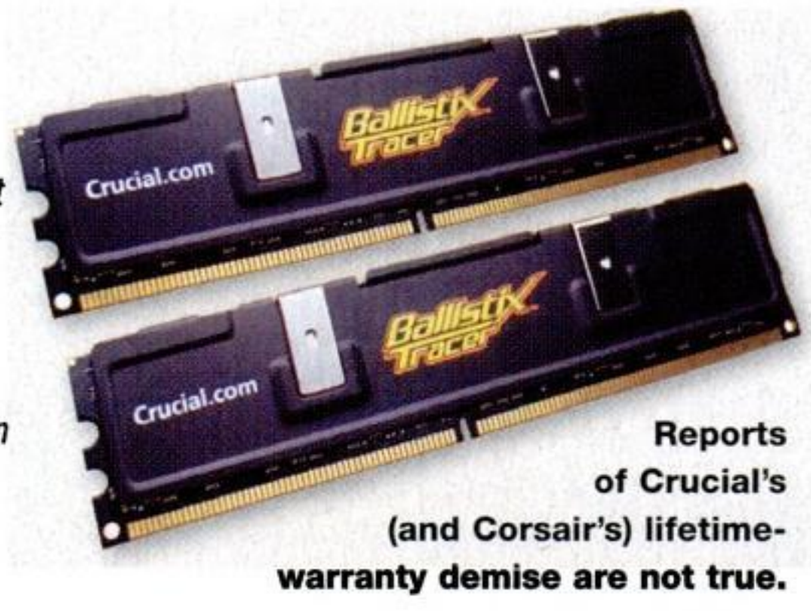
Asus said it indeed released the 7800GT TOP Silent, which was a popular product but was soon eclipsed by the 7900 GT parts. Asus officials couldn't tell the Dog if the company planned to offer a Silent version for the 7900 GT, but they assured the Dog that the 7800 part shipped and lived its full life cycle.

The Dog contacted Asrock about its ConRoe945G-DVI board and was told that the product is available at Ewiz.com. The company said the 775Twins-HDTV R2.0 is also available—although, not in the United States or apparently Canada either.

Intel's Core 2 Duo rollout was slow but at least it's moving. The Dog was able to find no fewer than eight vendors selling the CPU online, so keep looking.

Finally, Samsung officials said the HM160JI drive is available at Newegg.com and TigerDirect.com, but the Dog was unable to find one at either site. Note, however, that the Samsung isn't the largest SATA notebook drive available. Seagate manufactures a 160GB Momentus in parallel and SATA trim, and Fujitsu's 200GB MHV2200BT is the current capacity king, and it's likely quiet with its 4,200rpm spindle speed. The Fujitsu, however, is a 12.5mm drive, which could make it a little pudgy for some rigs.

Intel's hot new Core 2 Duo CPUs are difficult to find, but the Dog doesn't think they're quite "vaporware."



Reports of Crucial's (and Corsair's) lifetime-warranty demise are not true.

ARE THESE LIMITED LIFETIME-WARRANTIES LIMITED?

I was shocked to read on Crucial's and Corsair's web pages that they are changing their warranty policies. I have always purchased these two brands because of their outstanding warranties.

It seems that now both companies are losing their rock-solid faith in their product. Like many other readers, I will always spend the few extra dollars for a quality product. The question is, are Crucial and Corsair offering "quality" products if they aren't backed as such?

— Vern Haynes

After checking with both Crucial and Corsair, the Dog can report that the companies have not changed their warranties on RAM. Reports of warranty "changes" are likely due to confusion arising from the shorter warranties on other newer, non-system RAM products.

And speaking of warranties, reader Mark Arce barked at the Dog to say that the September column neglected to mention other eVGA products that carry a lifetime warranty. Those parts, according to Arce (and verified by the Dog) are: AR, AX, BR, BX, DR, DX, FR, FX, SG, SL, and S2. And just so you know, the Dog isn't going insane in the membrane; eVGA added the new part numbers after the Dog's column went to press, so it only *seemed* like he was going senile. Woof.

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

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Recall **Alert**

In what has amounted to the largest battery recall in consumer electronics history, Dell is recalling some 4.1 million notebook PC batteries that might overheat and pose a fire hazard. Dell said it has received six reports of batteries overheating, resulting in property damage. No injuries have been reported.

2.7 million of the bad batteries were sold in the U.S., with an additional 1.4 million packs sold outside the U.S. The batteries were sold in Latitude D410, D500, D505, D510, D520, D600, D610, D620, D800, D810; Inspiron 500M, 510M, 600M, 700M, 710M, 6000, 6400, 8500, 8600, 9100, 9200, 9300, 9400, E1505, E1705; Precision M20, M60, M70, M90; and XPS, XPS Gen2, XPS M170, XPS M1710. The batteries were manufactured by Sony in Japan and China and sold in notebooks between April 2004 and July 2006.

Although the recall is huge in scope, not every battery is part of the recall. The Dog checked two Dell notebooks on his desk that are part of the recall and neither of the battery cells were affected. First, check to see if your notebook model is included in the list above. Then remove the cell and look for the white label with two bar codes on it. The battery model is identified by the second series of numbers in the lower bar code. For example, on a battery marked JP-3F5132-XXXXX-XXX-0123, 3F5132 is the model number. Ignoring the first letters of the sequence, check if you battery has one of the model numbers in this list: 1K055, C5340, D6024, JD616, U5867, X5333, 3K590, C5446, D6025, JD617, U5882, X5875, 5P474, C6269, F2100, KD494, W5915, X5877, 6P922, C6270, F5132, M3006, X5308, Y1333, C2603, D2961, GD785, RD857, X5329, Y4500, C5339, D5555, H3191, TD349, X5332, Y5466.

If, for example, your battery is marked JP-31K055-12345-123-123, the battery is part of the recall. If your model number is on the above list, you should visit Dell's website at www.dellbatteryprogram.com, (or by way of www.dell.com), where you'll be asked to enter the cell's entire part number. You can also call Dell at 866-342-0011 between 8 a.m. and 5 p.m. Central time, Monday through Friday, where you can have the full part number checked to see if it's a bad battery.

If your cell is bad, you should immediately remove it from your notebook PC and stop using it. Dell says you can continue to use the notebook running on the AC adapter, but you should stop using the bad battery while Dell ships a replacement battery to you.

Dell is recalling a whopping 4.1 million batteries.

Dell isn't the only company this month with battery problems. Apple has also initiated a worldwide battery recall for a limited number of new Intel-based MacBook Pro notebooks. The recall affects only 15-inch MacBook Pro's sold between February and May 2006. Apple's batteries, fortunately, don't overheat and pose a burn hazard, they just seem to be poor performers. The bad batteries have the model number A1175 and a 12-digit serial number that ends with U7SA, U7SB, or U7SC. If you have one of the poor-performing batteries, Apple will ship a free replacement, and because there is no safety hazard, you can continue to use the battery. For more information visit https://support.apple.com/macbookpro15/batteryexchange/index.html. MPC

Some batteries used in Apple's new Mac Book notebooks could be defective.

(pwned)

(pwner)

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GAME PROGRAMMING

www.uat.edu > 800.658.5744

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AS REAL AS IT GETS

After that, let's see you rescue an injured climber on Mt. Kilimanjaro. Or take on the world's best pilots in the Red Bull Air Races. With 23 aircraft and over 50 real-world missions, it's the most realistic version yet. Whole cities and airports have been faithfully recreated, with a 16X overall improvement in terrain graphics. Suddenly, calling it a "simulator" just doesn't seem right.

(ACTUAL GAME SCREEN SHOT)

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FIX your PC!

25 MUST-HAVE UTILITIES THAT WILL KEEP YOUR PC PURRING!

BY PAUL LILLY

Remember when Windows XP first came out, and you were as giddy with the new functionality as a toddler opening a train set on Christmas morning? Remember when your Windows XP install felt zippy and fast? Well that was eons ago—now the caboose has lost its sheen and the engine is dragging ass. In order to get things running at full steam again, you need a set of kick-ass tools and utilities to revive the five-year-old XP install.

That's right, we're talking about teaching your old dog new tricks. A killer utility suite can breathe new life into an old OS—letting you do everything from tweak your fan's speed to browse your PC more efficiently, and more! There are so many utilities to choose from that it can be dizzying separating the useful from the ill-conceived, not to mention the utilities that are just payloads for malware.

Luckily for you, we've already done the research and compiled the best assortment of goodies we've ever offered, many of them free! Ranging from crucial security applications to nifty widgets we wouldn't want to be without, this is the software we install on every PC we build! Read on, and prepare your clicking finger to install these *25 must-have utilities!*

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ILLUSTRATION BY STEVE KELLER

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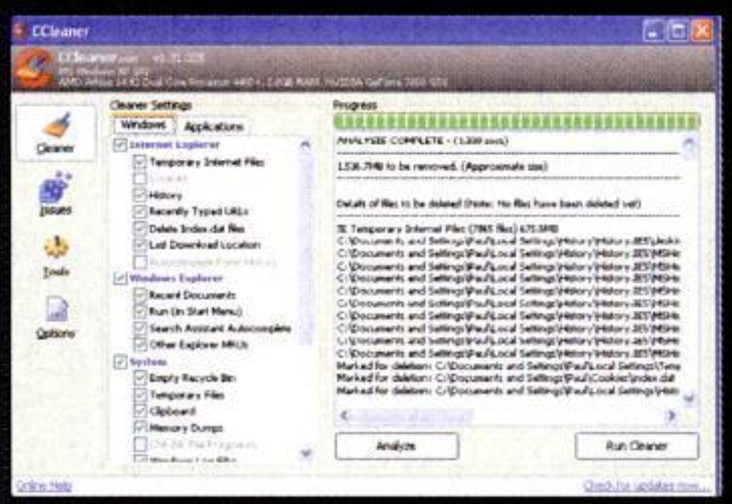
SYSTEM CLEANER

CCleaner

We admit it, we can be slobs, but even we didn't realize just how much hard drive space we waste. Clearing out temporary Internet files and other common cruft helps a little, but the *Disc Cleanup* app that comes with Windows barely dents the remnants left behind by your daily computing tasks.

Before shelling out for a new drive, try *CCleaner* (the first "C" stands for crap). In addition to clearing out Internet files, *CCleaner* nixes unused registry entries, old prefetch data, temporary files left by third-party applications, and an assortment of other clutter. It even scans for potential problems and offers to fix them.



Using *CCleaner*, we recovered a whopping 1.5GB of underused space on a month-old installation of Windows!

FREE www.ccleaner.com

FILE RECOVERY

File Scavenger

Professional data-recovery services charge hundreds of dollars to recover the contents of a dead drive. Quetek's *File Scavenger* costs $50 and is worth every penny. We're amazed at how well this program works compared with other recovery software, and we were shocked when it salvaged data from a hard drive in such bad shape that it incorrectly identified itself as a FAT16 drive. Even reformatting and reinstalling Windows didn't faze *File Scavenger*, it dutifully restored our files without a hitch. Make sure you install *File Scavenger* on a partition or hard drive other than the one that holds your lost data, lest you overwrite your files!

Oh, no! Did you empty the Recycle Bin when it contained an accidentally deleted file? Let *File Scavenger* track it down and restore it!

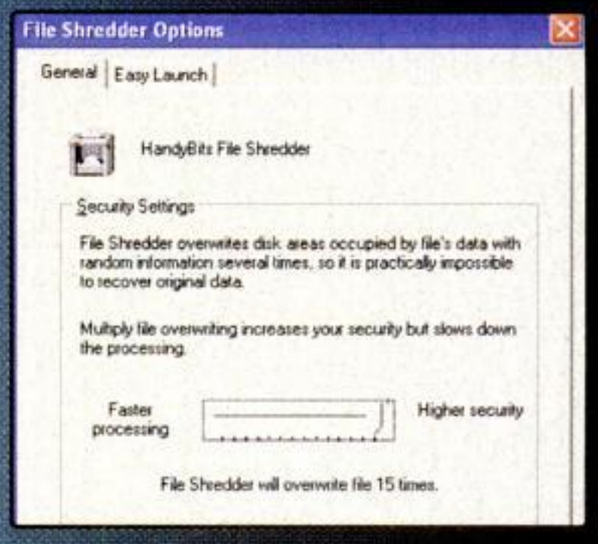
$50 www.quetek.com

DATA DESTRUCTION

File Shredder

You don't simply toss credit card statements and other private documents in the garbage, do you? A security-minded individual invests in a file shredder to protect his old documents from prying eyes.

You should give equal consideration to your PC data. A file thrown into the Recycle Bin is easily recovered, even *after* you empty the trash. HandyBit's *File Shredder* overwrites deleted files up to 15 times, rendering data recovery virtually impossible. And the interface couldn't be easier—drag and drop files into the app, select an entire folder, or right-click and highlight the "Destroy with Shredder" option. Best of all, there's no paper mess!


File Shredder Options
General
Easy Launch
HandyBits File Shredder
Security Settings
File Shredder overwrites disk areas occupied by file's data with random information several times, so it is practically impossible to recover original data.
Multiply file overwriting increases your security but slows down the processing.
Faster processing
Higher security
File Shredder will overwrite file 15 times.

Want to get rid of an embarrassing file titled "To My Snookum Wookums"? Shred it with *File Shredder!*

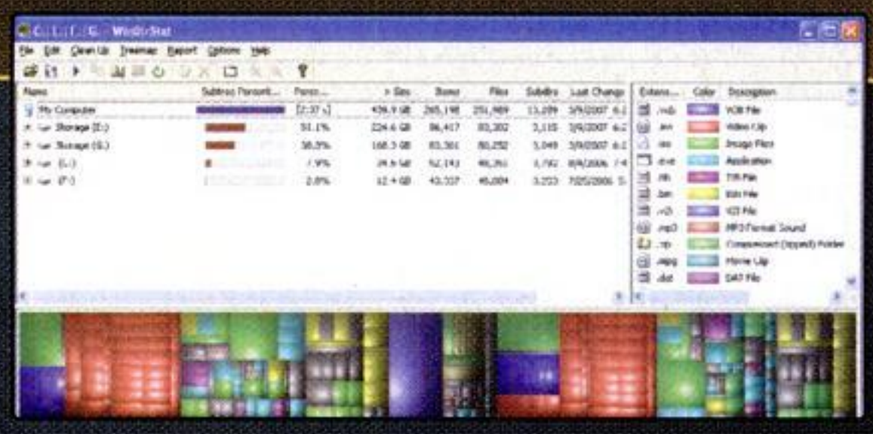
FREE www.handybits.com/shredder

DISK SPACE ANALYZER

WinDirStat

Is your 750GB drive already full? Wonder where the free space went? *WinDirStat* tells you exactly what's taking up the space on your hard drive and breaks it down by drive or by partition. The graphical display paints a colorful picture of your entire hard drive's directory structure, so you can quickly tell that your pr0n directory is the culprit.

More than simple eye candy, *WinDirStat* makes it easy to locate the files that are consuming the most space. When you want to know which folder or file is taking up a sizeable percentage of your drive, click its colored chunk and *WinDirStat* identifies the corresponding file and where it's located. Conversely, you can click a folder to see the corresponding space highlighted in the treemap. Now that's groovy!



***WinDirStat* takes the mystery out of the files and file types that are consuming the most hard drive space.**

FREE windirstat.sourceforge.net

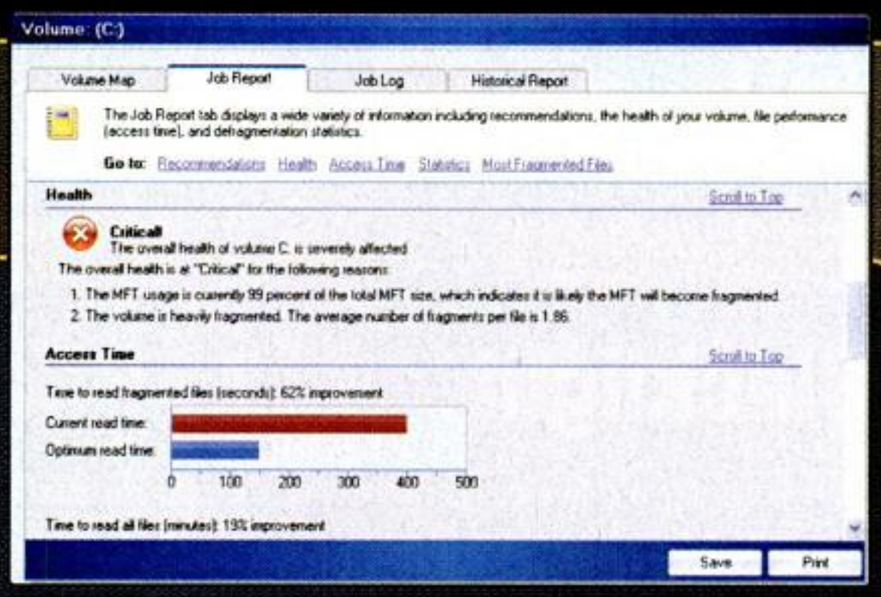
Copyrighted material

DISK DEFRAGGER

Diskeeper 10

Over time, the files on your hard disk become scattered across the platters, and can result in a performance hit. A fragmented drive is the PC equivalent of storing your cereal bowls in the attic and spoons in the basement. Defragging rearranges the drive's contents so that related files are near each other, putting the bowls in the cabinet and spoons in the drawer below.

Diskeeper defrags your hard drive quicker and more efficiently than Windows' built-in defragger, and it can even organize inaccessible files, such as the Windows pagefile and MFT. Once your drive is defragged, you can use the scheduling feature to ensure you never have to worry about a fragmented drive again.


Volume: (C:)
Volume Map
Job Report
Job Log
Historical Report
The Job Report tab displays a wide variety of information including recommendations, the health of your volume, file performance (access time), and defragmentation statistics.
Go to: Recommendations Health Access Time Statistics Most Fragmented Files
Health
Scroll to Top
Critical!
The overall health of volume C: is severely affected
The overall health is at "Critical" for the following reasons:
1. The MFT usage is currently 99 percent of the total MFT size, which indicates it is likely the MFT will become fragmented.
2. The volume is heavily fragmented. The average number of fragments per file is 1.86.
Access Time
Scroll to Top
Time to read fragmented files (seconds): 62% improvement
Current read time:
Optimum read time:
0 100 200 300 400 500
Time to read all files (minutes): 19% improvement
Save
Print

Defragging might not be sexy, but regular use of *Diskeeper* can result in significantly improved disk performance.

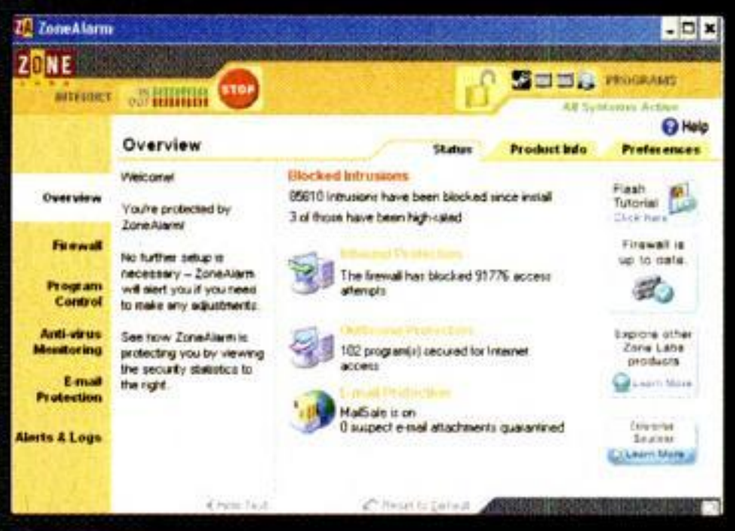
$30 **www.diskeeper.com**

FIREWALL

ZoneAlarm

Hackers have declared war on anyone with Internet access, so you should consider your computer constantly under attack. An unprotected PC will be infected with worms and other nasties within minutes of going online. Yes, we said *minutes*!

There are multiple software firewalls, but we turn to *ZoneAlarm* to stop hackers dead. *ZoneAlarm* monitors both incoming and outgoing traffic, alerting you to any threats. You can even view logs that show the geographical origin of your attackers. If you have a home network running, be sure to add each PC into *Zone Alarm's* trusted zones.



***Zone Alarm's* interface is easy for novices to configure and powerful enough for advanced users.**

FREE **www.zonelabs.com**

ANTIVIRUS

AVG Free Edition

Whoever said the best things in life aren't free obviously didn't have *AVG Free Edition* installed on their PC. *AVG* includes features worthy of a price tag, but the only thing it will cost you is the time it takes to download.

The basic scheduler does most of the work, keeping virus definitions up to date and scanning your system at an interval that you set. And should you accidentally click an infected file, *AVG's* Resident Shield will protect your PC; it will warn you before the malicious software has an opportunity to do any damage. Remember to create a rescue disk capable of cleaning your PC in DOS mode—you'll need it if you ever suffer a serious infection.

Can a free virus scanner really rival costly alternatives? *AVG* says yes, and we agree!

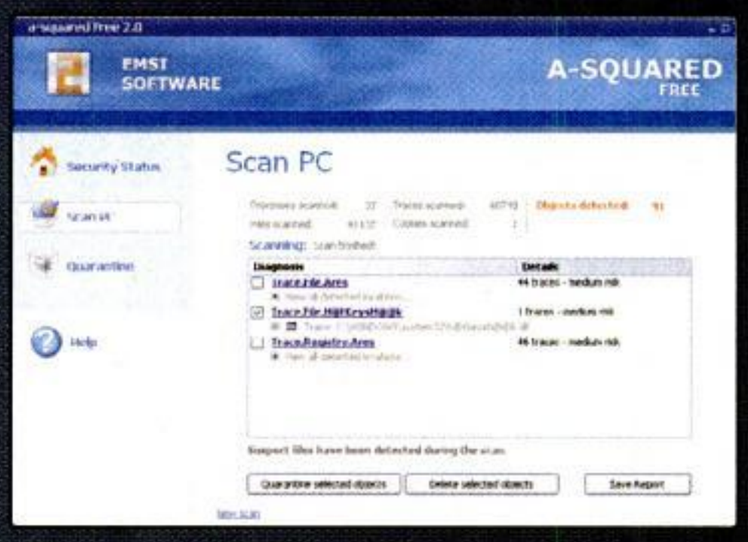
FREE **http://free.grisoft.com**

ANTI-SPYWARE

A-Squared

Dialers and trojans and worms, oh my! It's a veritable jungle of malware on the Internet—even the most prudent surfer can fall victim to an infestation. Arm yourself with *A-Squared*, a spyware salve that soothes ailing PCs and cures an infection before it spreads.

A-Squared scans for all kinds of spyware, picking up variants that other scanners miss. If you happen to get infected by a brand-new breed of malware, there's a good chance it won't get past the heuristic scan. In case of false positives, especially with heuristic software, it's a good idea to quarantine unknown infections rather than deleting them outright.



When safe surfing habits aren't enough, turn to *A-Squared* and rid yourself of spyware!

FREE **www.emsisoft.com/en/software/free/**

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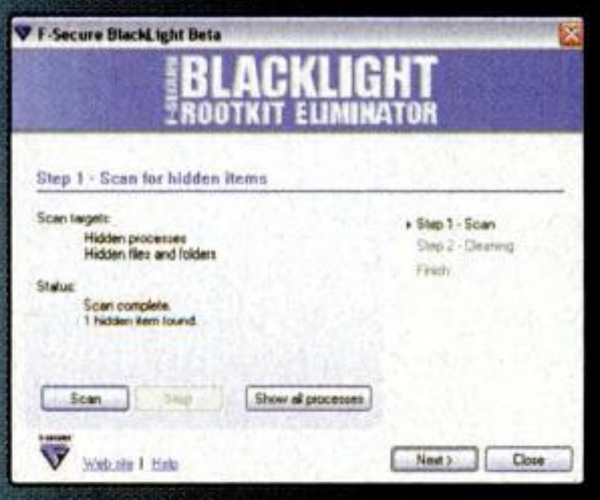
FIX your PC!

ROOTKIT SCANNER

Blacklight

As much as we'd like to recommend only one anti-malware program, there are just too many types of nasty software in the wild for any single program to catch them all. One particularly nasty type of malware is the rootkit, which hides malicious code deep within the OS. Rootkits are virtually undetectable to traditional scanners.

Picking up where other malware scanners leave off, F-Secure's *Blacklight* runs a fine-tooth comb through your system and exposes harmful rootkits. If found, *Blacklight* gives you the option to remove the offending code with the click of a button. Don't you wish everything in life were so easy?



Most malware scanners also look for rootkits, but *Blacklight* specializes in tracking them down.

FREE www.f-secure.com/blacklight

ANTI-MALWARE

HijackThis

Despite the best efforts of spyware scanners such as *A-Squared* and *Blacklight*, some malware infiltrates Windows so deeply that the only solution is a full-blown reinstallation of Windows. Before waving the white flag, however, we turn to *HijackThis*.

HijackThis doesn't go after spyware, instead it targets the methods used by rogue programs to thwart removal efforts. A scan takes just seconds to complete, but it spits out a complete log of every single process running in your system. Before you delete, you should carefully analyze the logfile (or ask for help from the experts on your favorite web forum) so you only excise the harmful apps.

HijackThis - v1.99.1
Below are the results of the scan. Be careful what you delete, HijackThis cannot determine what is bad and what merely customized by you. The best thing to do is save a log file and show it to knowledgable folks.
PayPal DONATE
Scan & fix stuff
Save log
Fix checked
Info on selected item...
Other stuff
Info...
Config...
Add checked to ignorelist

Does your system still seem infected after running anti-spyware and antivirus scans? *HijackThis* will expose any leftover remnants!

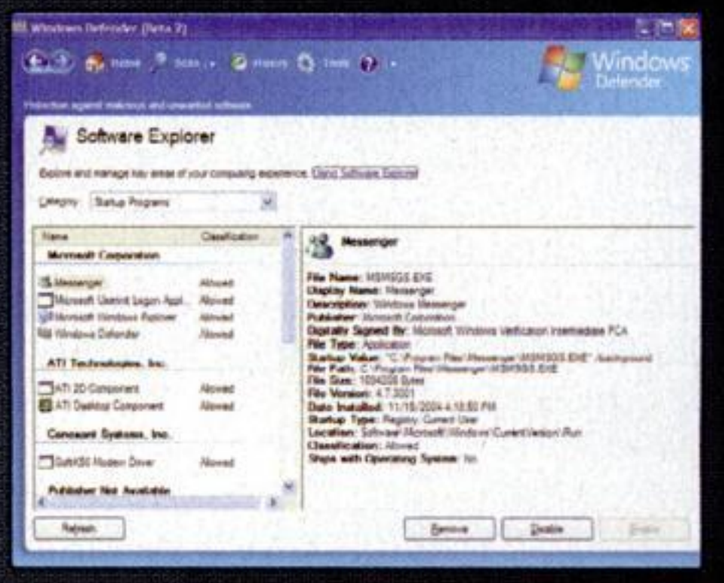
FREE www.merijn.org

STARTUP DIAGNOSTIC

Windows Defender

Microsoft's beta anti-spyware program evolved into what's now *Windows Defender.* Along with spyware scanning, the whiz kids at Microsoft added a wealth of other diagnostics with the Software Explorer function. *Defender* gives you a detailed list of the software that runs each time Windows loads, with the option to disable individual startup programs altogether.

In addition to the name of the application and the location of the executable, Software Explorer gives a description of the file, whether or not it shipped with the OS, the date and time of installation, and even the vendor's name.



With *Windows Defender,* you can cut back on startup programs for a quicker boot time.

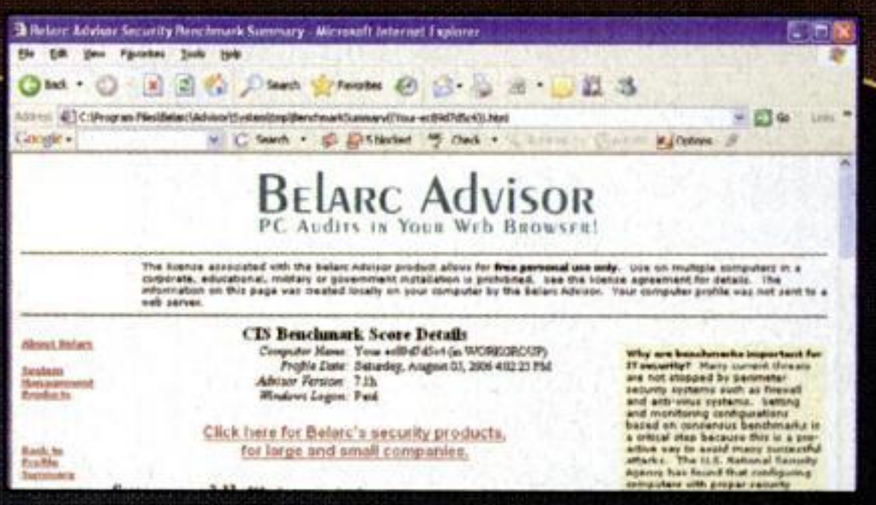
$50 www.microsoft.com

SYSTEM PROFILER

Belarc Advisor

We hate being audited, unless *Belarc Advisor* is assigned to the case. The program creates a comprehensive list of all the components, devices, and software you have installed. It even tells you which user accounts have logged onto your system, and it will generate a list of the Microsoft hotfixes your machine is missing.

After digesting the comprehensive report, click the CIS benchmark score to see how your system stacks up from a security standpoint. *Belarc Advisor* tells you where you're vulnerable and what you can do about it. All this in a measly 956KB package!


Belarc Advisor Security Benchmark Summary - Microsoft Internet Explorer
BELARC ADVISOR
PC Audits in Your Web Browser!
CIS Benchmark Score Details
Click here for Belarc's security products for large and small companies.

Think your PC is secure? Let *Belarc Advisor* give you a second opinion.

FREE www.belarc.com/free.download.html

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Cool Performance

EPP Enhanced Performance Profiles

HOW CORSAIR MAINTAINS TECHNOLOGY LEADERSHIP

CORSAIR™

INNOVATION

PERFORMANCE

RELIABILITY

Here's the latest in Corsair's ten year heritage of innovation in performance memory: we've redefined memory heat sink technology. And the result is unprecedented performance and reliability. When we ran a preview module through system benchmarks at COMPUTEX, an overclocked DHX module with our optional airflow fan was able to hit a heart-stopping 1250MHz (PC-10,000) while maintaining cool, reliable performance.

Protect Components While You Push Performance

Pushing performance specs generates heat, and that can compromise reliability and component life. The advanced cooling ability of DHX heat sinks keeps your memory safe and reliable even as you push it to the limit. Under the name XMS2 Dominator, this DHX technology will be showing up on both Corsair parts designed for extreme overclocking and on memory designed for performance computing and gaming.

Also Featuring Enhanced Performance Profiles (EPP)

As with all new Corsair performance memory, XMS2 Dominator modules feature EPP, the new open standard for the Serial Presence Detect (SPD) jointly developed by NVIDIA and Corsair. EPP simplifies overclocking for beginners and provides unparalleled control for experts.

AIRFLOW

An optional fan (not shown) provides even more cooling and protection.

DHX DUAL-PATH HEAT XCHANGE

Corsair's proprietary DHX technology dissipates heat two ways: it draws heat away from the module through the RAMs and provides an additional path for heat transfer within the module through the ground plane!

ORDER FROM THESE OFFICIAL CORSAIR RETAILERS OR VISIT WWW.CORSAIRMEMORY.COM

Fry's ELECTRONICS · MICRO CENTER The Ultimate Computer Store · newegg.com · TigerDirect.com · ZipZoomfly.com

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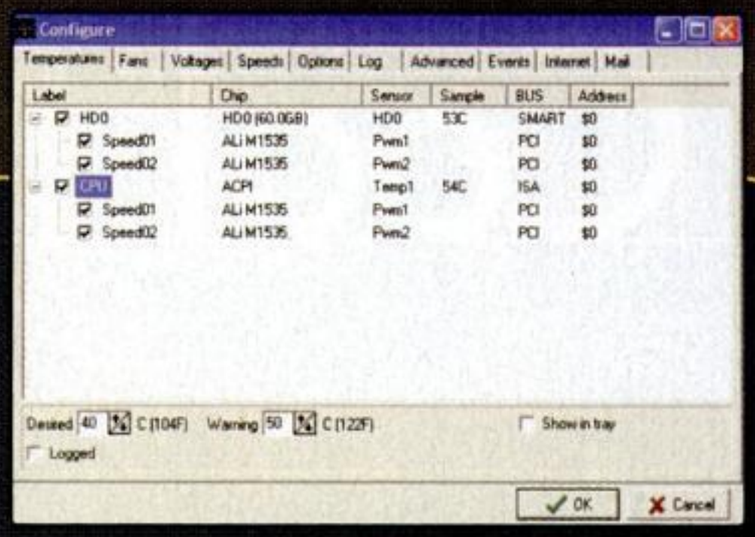
FIX your PC!

FAN CONTROLLER

SpeedFan

Tasty dual-core processors, yummy SLI videocards, and delectable 10,000rpm hard drives have sated our appetite for raw power but leaves us thirsting for a quieter computing experience. *SpeedFan* quenches this thirst with an assortment of controls.

SpeedFan reports vital temperatures from your CPU cores and motherboard, and then automatically throttles the fans' speed based on the parameters you set. All that's required is a compatible motherboard (most models are) and fans you plug directly into the board. There are even custom preset profiles available for download that others have created for specific motherboards, taking the guesswork out of the configuration.



***SpeedFan* will keep your PC quiet by letting you adjust your fan speeds from inside Windows.**

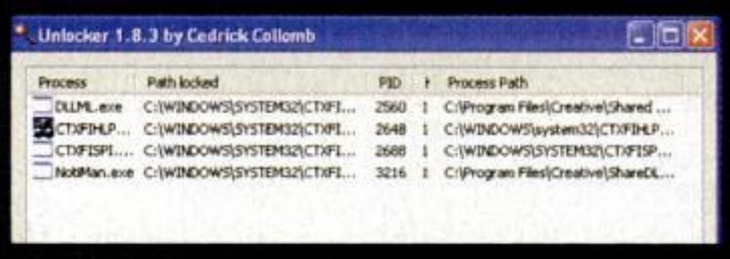
FREE www.almico.com/speedfan.php

FILE MONITOR

Unlocker

Renaming and deleting files are simple tasks, right? Usually, but when a file is locked by another application, Windows doesn't tell you what app or user has locked it. There's no way to tell what program holds the keys to your file, short of killing one program after the other until the file is freed up.

Unlocker solves this problem and puts you back in control. With a simple right-click, this nifty Windows Explorer extension tells you which app has its grubby paws on your file and then gives you the option to rename, move, or delete the file despite the lock. It will even stop the offending process altogether. Some files are locked for good reason and deleting them can render a program unusable. When in doubt, look it up on Google.



When we tell Windows to delete a file, the last thing we want to see is "No!" *Unlocker* gives us the final word, and that word is "Yes!"

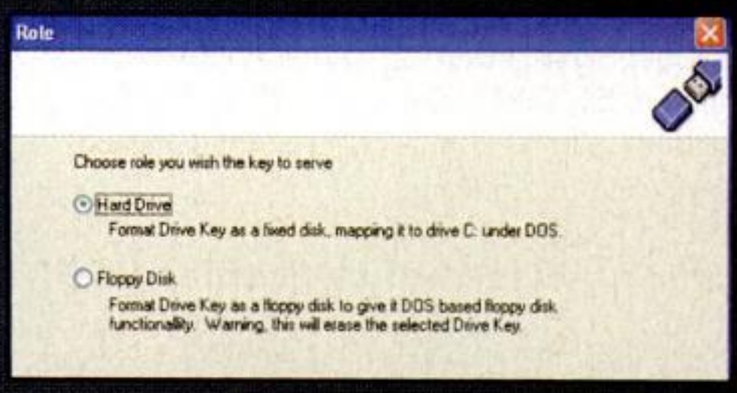
FREE http://ccollomb.free.fr/unlocker

USB BOOT MANAGEMENT

Drive Key Boot Utility

The floppy drive has one foot firmly in the grave—the only thing we use ours for is BIOS flashing and to install the occasional F6 driver. With bootable USB keys, it might be time to seal the casket on the floppy drive once and for all.

HP's *Drive Key Boot Utility* quickly turns your old USB key (you know, the 64MB or 128MB you just replaced with a swanky 4GB monster) into a bootable device. Throw your motherboard's latest BIOS and flashing program onto the key and you're good to go. Just be sure your BIOS supports booting from USB drives, and change your mobo's boot order so the USB drive is ahead of your hard drive.


Role
Choose role you wish the key to serve
Hard Drive
Format Drive Key as a fixed disk, mapping it to drive C: under DOS.
Floppy Disk
Format Drive Key as a floppy disk to give it DOS based floppy disk functionality. Warning, this will erase the selected Drive Key.

Still using a floppy? Download HP's USB boot utility and finally rid yourself of that archaic contraption.

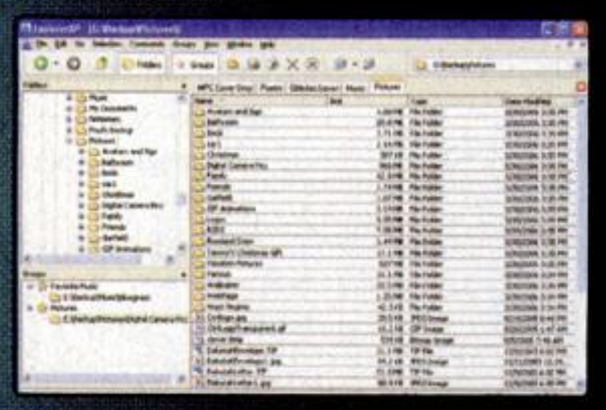
FREE http://tinyurl.com/kaytz

FILE MANAGEMENT

ExplorerXP

ExplorerXP does everything Windows Explorer does, plus a whole lot more. By including tabs, a la *Firefox*, *ExplorerXP* makes it easier to manage multiple browser windows and manipulate files.

For commonly accessed folders, *ExplorerXP* lets you create groups—for example, you can create a group called "Entertainment" to include your movie, music, and gaming folders, even if they're all on separate partitions. If you have multiple files to rename, just highlight them, label appropriately, and *ExplorerXP* will rename each one, adding a sequential number at the end (VacationPic001, VacationPic002, etc). Need to transfer a large file but don't have a large enough USB key or optical disc? No problem: *ExplorerXP* will break it up into manageable chunks.



Unlike Windows Explorer, *ExplorerXP* shows you the sizes of folders. We dig it!

FREE www.explorerxp.com

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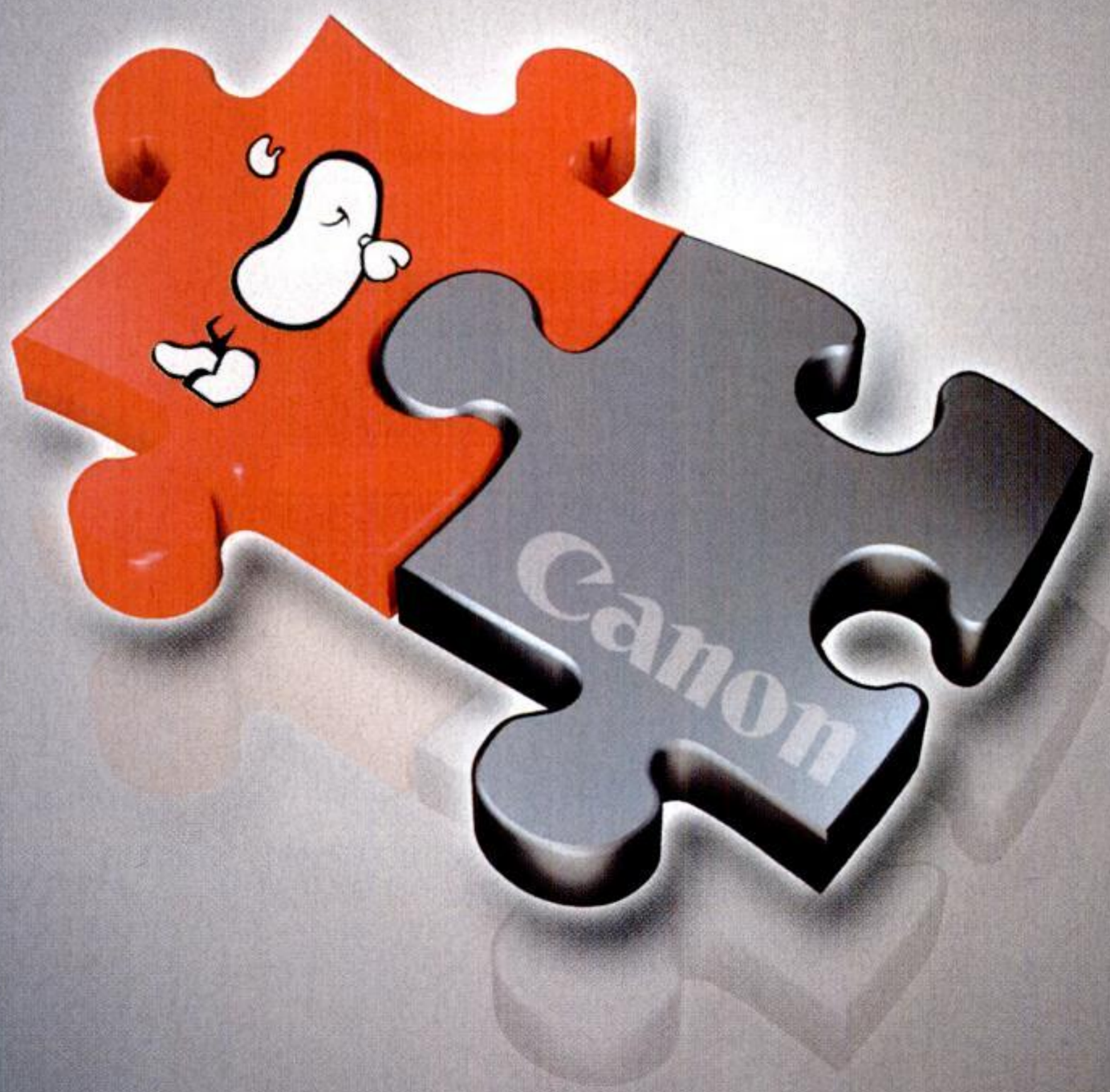
ZIPZOOMFLY.COM

Where Everything Comes Together



Canon

PowerShot SD 30

5.0 MP Digital Camera

- 1.8 Inch LCD Screen
- DIGIC II Image Processor
- 2.4x Optical Zoom
- Print/ Share button for easy direct printing
- Canon U.S.A. one-year warranty

PowerShot SD700 IS

6.0 MP Digital Camera

- Large 2.5 inch LCD Screen
- DIGIC II Image Processor
- 4x Digital/ 4x Optical (16x Combined Zoom)
- Print/ Share button for easy direct printing
- Canon U.S.A. one-year warranty

ZipZoomfly.com

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Sales: sales@zipzoomfly.com or call 1.877.228.6958

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FILE ENCRYPTION

TrueCrypt

We shudder to think what would happen if our top-secret plans for world domination fell into the wrong hands. *TrueCrypt* gives us peace of mind, and you can have it too!

You don't even need to install *TrueCrypt*, making this encryption program the ideal candidate for USB keys. Just copy the setup folder to your device and click the executable. *TrueCrypt* will create a virtual password-protected partition, and can even hide the partition, so your data will remain secure even if your password becomes compromised.

Paranoid that AES encryption is not enough? Try a three-layer cascading approach!

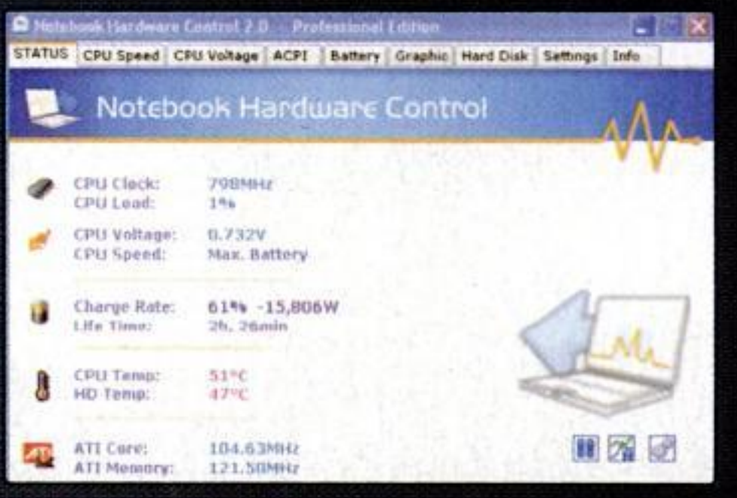
FREE www.truecrypt.org

NOTEBOOK POWER MANAGEMENT

Notebook Hardware Control

Few things are as frustrating as being caught without a power source when your notebook's battery runs dry—when it comes to surviving in the mobile world, battery conservation is the name of the game. Grab a copy of *NHC* and take control of your power management.

NHC allows you to dynamically switch your CPU's frequency, using an intuitive GUI. More than just a one-trick pony, *NHC* also serves as a system monitor, reporting on such system vitals as CPU and hard drive temperatures, and even how much free RAM is available. We particularly love being able to set processor voltages for different multipliers—that's perfect for overclockers!



Let *NHC* manage your notebook's power consumption and never get stranded with a dead battery again!

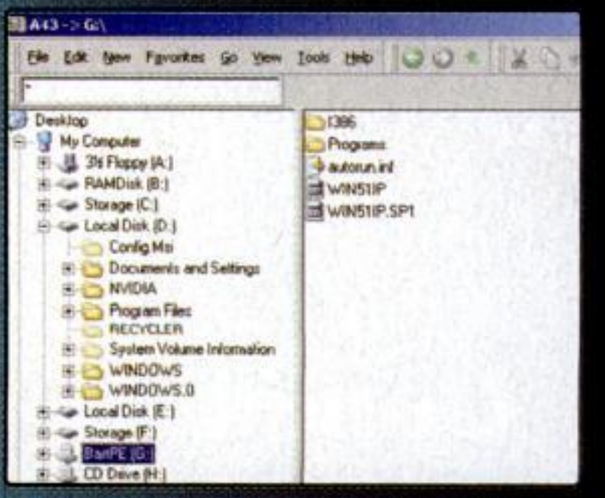
FREE www.pbus-167.com/nhc/nhc.htm

SYSTEM RECOVERY

BartPE

A borked hard drive doesn't necessarily mean all is lost, and *BartPE* has saved our hide on more than one occasion. Using a *BartPE* recovery disc lets us boot our PC even when the Windows install won't work. This allows us to recover data without first nuking and reformatting the drive, which would result in our files being lost forever.

BartPE is also compatible with a wealth of plugins that deliver additional functionality—*Firefox*, recovery software, *Nero* for CD-burning, antivirus programs, spyware scanners—you name it and there's a probably a plugin for it. No troubleshooting toolkit is complete without a *BartPE* disc.



Anyone who fixes PCs on a frequent or even semi-frequent basis should carry around a *BartPE* CD.

FREE www.nu2.nu/pebuilder

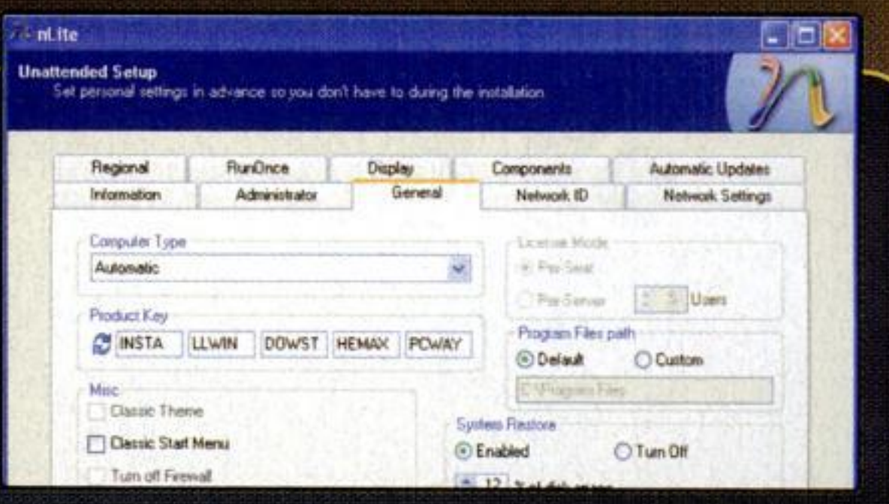
WINDOWS INSTALLER MANAGER

nLite

FREE www.nliteos.com

For installing Windows, there's the old-fashioned way and there's the *Maximum PC* way. Intrigued? Here's what you do: Copy the contents of your Windows CD to a folder on your hard drive, grab a copy of *nLite*, customize to your heart's content, and burn to a CD.

nLite's interface lays out all the options for you. Don't care for *Media Player?* Remove it! And *nLite* isn't just adept at removing items either—you can add service packs and hotfixes and skip the countless reboots associated with updating a new install. Heck, you can even integrate RAID drivers and avoid the hassle of F6 drivers entirely!



Don't care to sit in front of your PC while Windows installs? Use the Unattended Setup to automatically enter your CD key and network settings in your absence!

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[Energy Efficient]

ACCOMPLISH MORE WITH AMD PROCESSORS

Athlon™64 X2 4800+* (Socket AM2)

- Part Number: 80728-9
- Code Name: Windsor
- Thermal Power: 65W
- L1 Cache: 128KB x 2
- L2 Cache: 1MB x 2

Athlon™64 X2 4600+* (Socket AM2)

- Part Number: 80727-9
- Code Name: Windsor
- Thermal Power: 65W
- L1 Cache: 128KB x 2
- L2 Cache: 512KB x 2

Athlon™64 X2 4400+* (Socket AM2)

- Part Number: 80726-9
- Code Name: Windsor
- Thermal Power: 65W
- L1 Cache: 128KB x 2
- L2 Cache: 1MB x 2

Athlon™64 X2 4200+* (Socket AM2)

- Part Number: 80725-9
- Code Name: Windsor
- Thermal Power: 65W
- L1 Cache: 128KB x 2
- L2 Cache: 512KB x 2

Visit www.zipzoomfly.com for the most current pricing.

Athlon™64 X2 4000+* (Socket AM2)

- Part Number: 80724-9
- Code Name: Windsor
- Thermal Power: 65W
- L1 Cache: 128KB x 2
- L2 Cache: 1MB x 2

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SPAM FILTER

SpamPal

For fighting spam, there's *SpamPal* and then there's everything else. Using a combination of techniques—text analysis, Bayesian filtering, and old-fashioned blacklists—we've managed to banish spam from our inboxes, and you can too!

The latest betas of *SpamPal* don't even require you to configure your mail clients. The app just runs quietly in the background, and listens in on the traffic between your mail server and your mail client. When it decides that a message is spam, it puts a label in the subject line, which you can then use to filter offending messages into your junk email folder. You'll definitely want to install and configure the Regex and Bayesian plugins, for maximum spam-fighting power.

***SpamPal* will clear your inbox of spam; and best of all, it's free!**

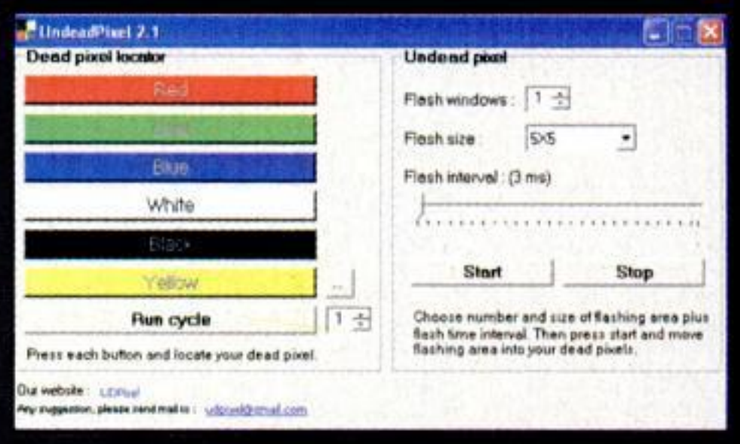
FREE www.spampal.org

LCD MAINTENANCE

UDPixel

Looking for dead pixels is about as fun as searching for Waldo, but it's a lot easier if you have the right tool. No, we're not talking about a magnifying glass; we're referring to *UDPixel*, a simple utility that quickly exposes both dead and stuck pixels on your LCD screen.

UDPixel works by displaying a series of colors over the entire display. If everything checks out when your screen's washed in red, move on to the next color. In the event you do find a stuck pixel, *UDPixel* attempts to fix it by targeting the affected area and rapidly flashing several colors.



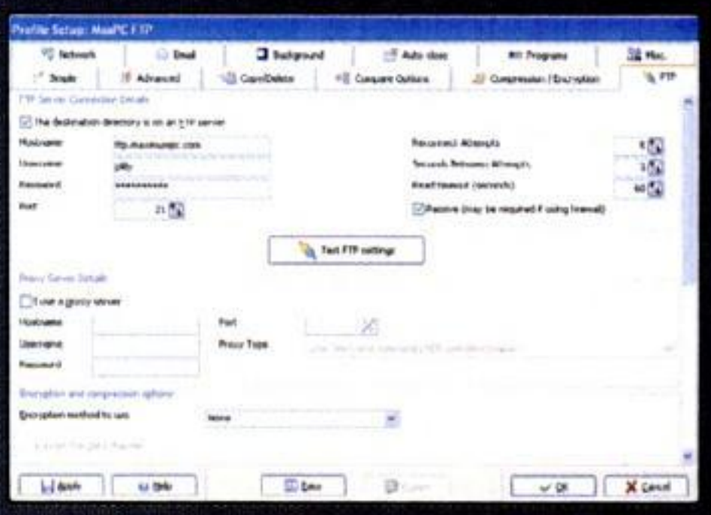
***UDPixel* exposes both dead and stuck pixels, making sure you don't get screwed when purchasing that new LCD monitor.**

FREE http://udpix.free.fr

BACKUP

SyncBackSE

What's that you say, you're not running a backup routine? Shame on you! *SyncBackSE* makes the process easy and convenient enough that you don't have any excuse not to back up. Just create a profile and follow the wizard's steps. And as its name implies, you can sync files or an entire hard drive from one system to a backup drive or even another machine, using a network connection or FTP. Test all these options with a simulated trial run before executing the real deal, and then set up an automated schedule for a seamless backup routine—we insist.



***SyncBackSE* lets you sync your files to an FTP site, and then retrieve or update them from your laptop, no matter where you are.**

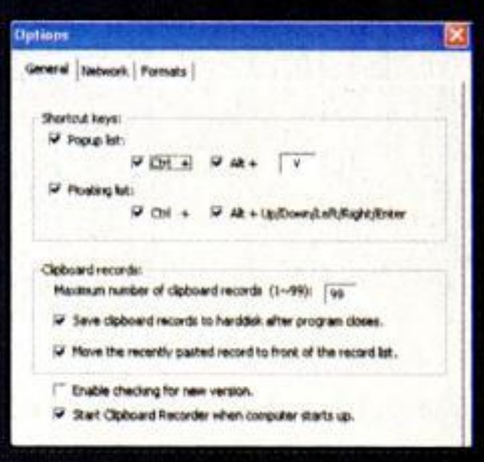
$25 www.2brightsparks.com

CLIPBOARD

Clipboard Recorder

It's the little things in life that keep us content—you know, tasks such as cutting, copying, and pasting. Such a simple concept, yet LW-Works has found a way to improve it.

Clipboard Recorder doesn't forget your clipboard's contents, at least not for the first 99 times you cut or copy. After that, the oldest records are overwritten one at a time, or you can manually delete what you don't need to keep. And get this, because *Recorder* saves its records to your hard drive, all your data remains after a reboot!



With room for up 99 entries, *Clipboard Recorder* ensures you'll never have to worry about accidentally copying over a crucial document!

FREE www.lw-works.com

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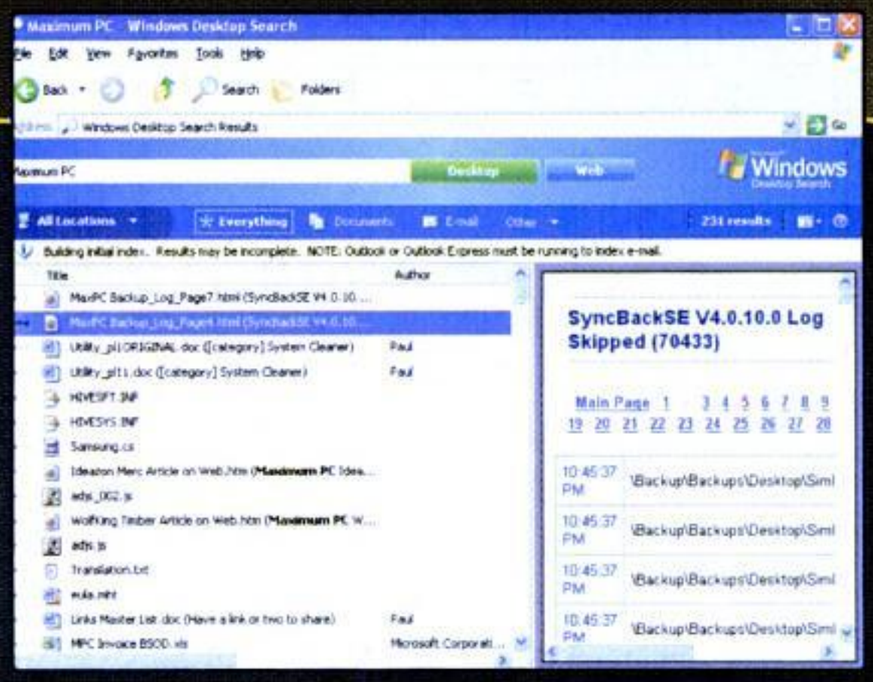
FILE INDEXING

Windows Desktop Search

Here's the scenario: Your boss just called and demanded a reprint of a report you wrote more than two months ago. No problem, you never delete anything; but finding it is another matter. Then it hits you: By the time the Windows search finishes, the deadline will have passed, and your promotion with it. Drat!

With *Windows Desktop Search,* you can still get that promotion! *WDS* indexes your entire hard drive, cataloging documents, music files, videos, pictures, and many other file types. It even pokes through your emails and contacts, delivering instantaneous results! The only thing it can't find is your keys.

FREE http://desktop.msn.com



We thought our hopes for quick searches were dashed when WinFS was cut from Vista, but *WDS* restores our faith that it can be done!

Be Your Own PC Mechanic!

Keeping up with your PC's maintenance doesn't need to be a drag. Follow our 15-minutes-a-week program and your machine will run smoothly with minimal effort from you!

WEEKLY

DEFRAG
Fragmented files rob your system's performance. Run *Diskeeper* at least once a week to keep your HDD in optimal shape.

CLEAR THE CACHE
Temporary Internet files need not become permanent. Have *CCleaner* zap everything from the *IE* and *Firefox* caches.

VIRUS SCAN
The best defense is to practice safe computing habits, but you should follow that up with a weekly scan using *AVG.*

SPYWARE/MALWARE SCAN
A-Squared and *Blacklight* will keep your PC squeaky clean, but only if you update and run them often.

INCREMENTAL BACKUP
Be prepared for a dying hard drive or a dead OS by running frequent backups—just tell *SyncBackSE* when and where.

OUTLOOK/THUNDERBIRD BACKUP
Losing a week or more worth of emails is a hair-pulling experience. Export your messages frequently, or store them on the mail server.

MONTHLY

FULL BACKUP
You should always back up important data to another location. Use *SyncBackSE* to coordinate regular backups over a network or FTP connection.

REMOVE UNUSED SOFTWARE
Who needs clutter? Uninstall unused apps and old games, and then scrub your system with a full *CCleaner* run. Mom would be so proud!

CHECK SYSTEM DRIVERS
Updated drivers improve performance and enhance compatibility. Routinely look for driver updates on the vendors' websites for your videocard, soundcard, chipset, and other components.

CHECK LOAD TEMPERATURES
Heat is the bane of your PC. Use your motherboard's monitoring tool or *SpeedFan* to verify safe thermals.

CLEAN FANS/FILTER
Dust buildup inhibits airflow and can raise temperatures unnecessarily. Blast those dust bunnies clear with a shot of compressed air.

CHECK HARD DRIVES
Scan your disk (Go to the Start Menu, then click Run and type `cmd <enter>` and then `chkdsk <enter>`) every month to keep your file structure fit.

BI-ANNUALLY/ANNUALLY

CHECK COOLANT LEVEL
Air-cooling aficionados need not bother, but water-cooling setups should be checked and topped off at least every six months.

CHECK FILTERS
Most air filters will last the life of your PC, but they do sometimes degrade. Check, clean, and replace if necessary.

LOOK FOR DEAD PIXELS
Dead and stuck pixels are both annoying and distracting. Check every six months over the duration of your LCD's warranty period.

UPDATE SOFTWARE
Only three things are certain—death, taxes, and software patches. There are a bunch, and many are significant. Keep your apps up to date.

UPDATE BIOS
Look for your motherboard's latest BIOS version. If there's a fix for a problem you've encountered, flash your BIOS.

CHECK WIRING
Cables wriggle loose and dangling wires interfere with fan blades. Whenever your case is open, give your wires a once-over and secure any loose fittings. MPC

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COME OUT & PLAY

Aurora™ m9700

Dominate in Double-Time.

The first 17" notebook to harness the power of dual 512 MB graphics cards.

NVIDIA SLI

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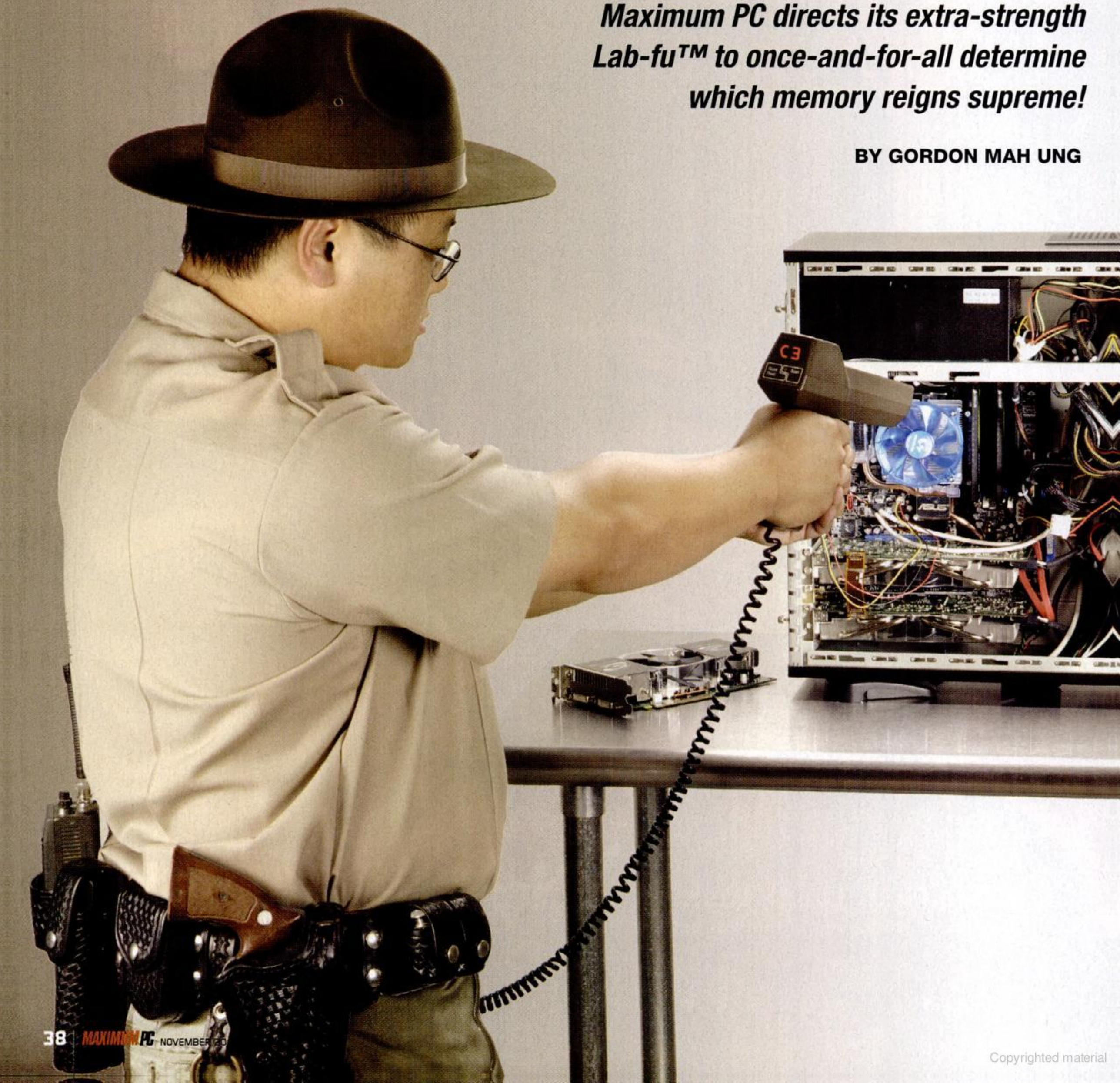
ANOTHER
MAXIMUM PC
CHALLENGE

THIS MONTH **MEMORY**

WHAT'S THE FASTEST MEMORY: HIGH BANDWIDTH OR LOW LATENCY?

Maximum PC directs its extra-strength Lab-fu™ to once-and-for-all determine which memory reigns supreme!

BY GORDON MAH UNG



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For something that's supposed to be as commoditized as toilet paper, pork bellies, and copper—buying RAM for a performance PC sure isn't as straightforward as it used to be.

Besides the confusing array of heat spreaders and LED accoutrements staring out at you through the blister pack, you also have to contend with the baffling matter of latency and clock speed—the two specs that are most important when considering a RAM module's performance potential. Latency describes the time it takes the memory to respond to requests. The lower the latency, the quicker the response. Clock speed determines the amount of data that can be transferred between the RAM and the rest of the system every second. The higher the clock speed, the greater the bandwidth. Both of these specs have a direct impact on RAM performance, but you have to choose between higher clock speeds and lower latency; usually you can't get both. The question is: Which matters more?

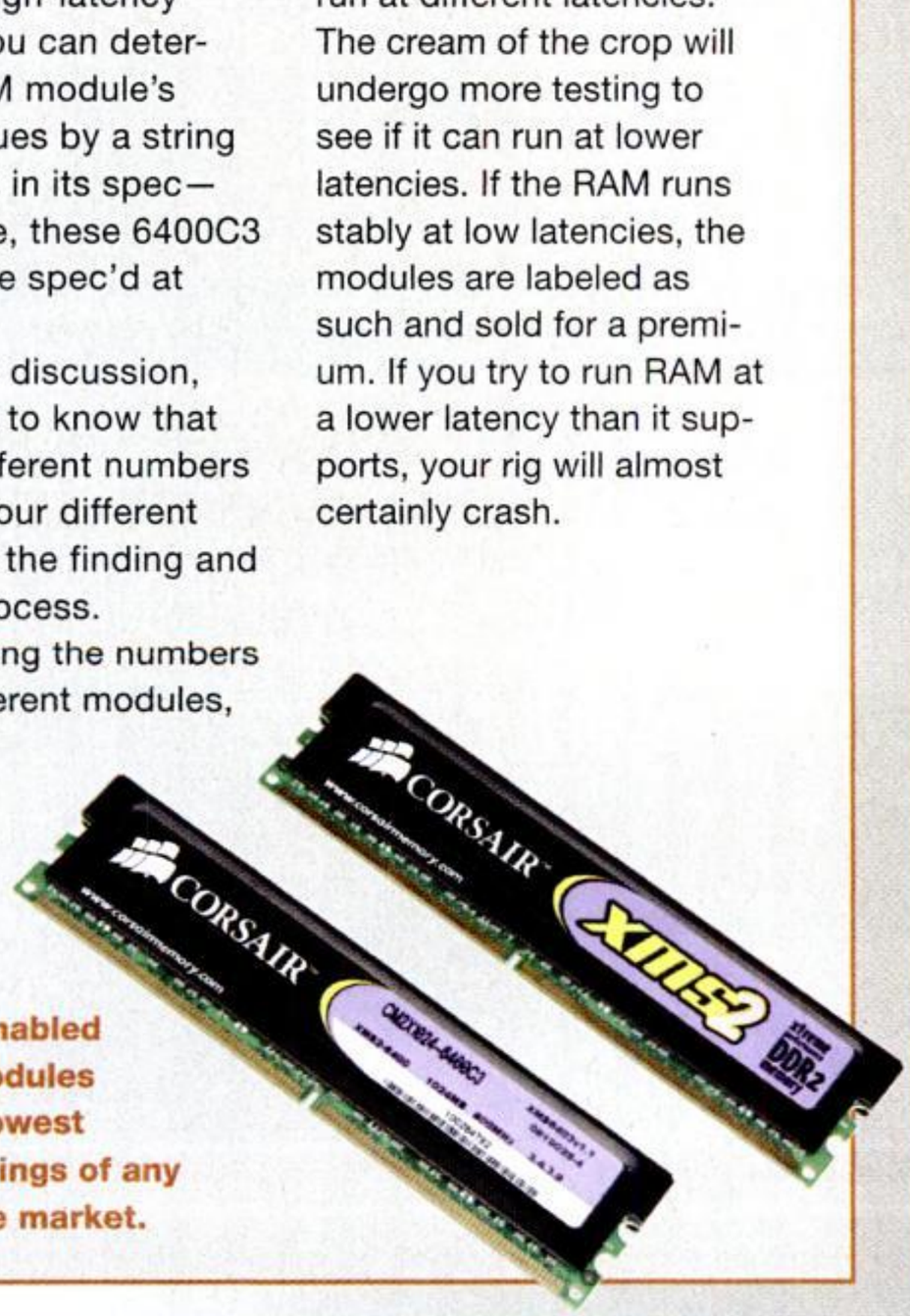
With both Intel and AMD on the DDR2 train, we decided to settle the score once and for all. We rounded up both types of DDR2 memory—one optimized for low latency, the other for more bandwidth—and ran them through a gauntlet of benchmarks to see which is faster. The results will surprise you!

Representing latency: Corsair 6400C3

Corsair's 6400C3 modules are *the* lowest-latency DDR2/800 modules on the market; they support the newfangled Enhanced Performance Profiles (EPP) for easier overclocking. Memory latency is defined as the length of time between sending a request and receiving the response. Low-latency memory is more responsive than high-latency memory. You can determine a RAM module's latency values by a string of numbers in its spec—for instance, these 6400C3 modules are spec'd at 3-4-3-9.

For this discussion, it's enough to know that the four different numbers represent four different portions of the finding and retrieval process. By comparing the numbers among different modules, you can easily tell which have the lower latencies. A 3-4-3-9 module will take less time to respond than a module spec'd at 5-5-5-10. Make sense?

Like any other performance-enhancing feature, lower latency comes at a cost. It requires higher-quality memory that's free from defects. As with the certification process for CPUs, manufacturers typically bake a batch of RAM and then test each of the modules to see how they run at different latencies. The cream of the crop will undergo more testing to see if it can run at lower latencies. If the RAM runs stably at low latencies, the modules are labeled as such and sold for a premium. If you try to run RAM at a lower latency than it supports, your rig will almost certainly crash.



The EPP-enabled 6400C3 modules sport the lowest latency timings of any RAM on the market.

Representing clock speed: Corsair 8500C5

High clock speed. It's good for the CPU so it must be good for RAM, right? To conduct our latency-vs.-bandwidth challenge, we grabbed a pair of highly clocked Corsair 8500C5 modules, which also support EPP for easier overclocking.

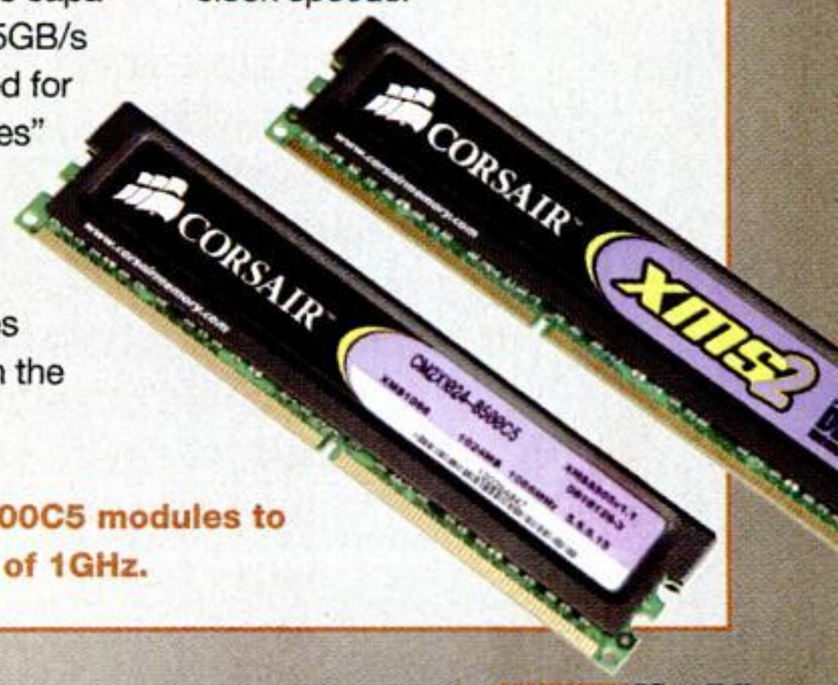
When looking at a package of RAM, it might be difficult to determine the actual clock speed of the memory, because it's expressed in different ways. On some RAM, the clock speed is listed right there on the package, such as DDR2533. That means it's DDR2 running at 533MHz. Alternatively, some RAM is identified by its theoretical bandwidth, such as PC3200, which indicates 3200MB/s (or 3.2GB/s) of throughput.

The memory we chose to represent high clock-speed bandwidth is smokin' fast, and it says so right in its name. That "8500" means it's capable of a theoretical 8.5GB/s of bandwidth. It's rated for operation at "data rates" of 1066MHz, compared to 800MHz for the low-latency RAM, while its latency values are clearly higher than the latter at 5-5-5-15.

We put the phrase data rates in quotes because the 8500C5 modules don't truly run at 1GHz. DDR2/1066MHz modules actually run at 266MHz, but because DDR2 fetches four chunks of data off the module per cycle, it's akin to fetching one chunk of data from RAM running at 1066MHz.

How much more bandwidth do you get with DDR2/1066 modules versus the Intel- and AMD-approved DDR2/800? Just look at the names: 1066MHz memory (aka PC8500) is rated for 8.5GB/s, while 800MHz memory (aka PC6400) is rated for a mere 6.4GB/s. It adds up to a theoretical increase of roughly 33 percent.

Of course, there's a hitch. Unlike low-latency modules that will run on nearly any system without running out of spec, memory designed for high speeds may require you to overclock your CPU to reach the RAM's intended clock speeds.



You can push the 8500C5 modules to data rates in excess of 1GHz.

ANOTHER

MAXIMUMPC CHALLENGE

HOW WE TESTED

For our test, we set up an Athlon 64 FX-62 in an Asus M2N32-SLI Deluxe motherboard, along with a single GeForce 7900 GTX videocard and a 400GB Western Digital WD4000KD hard drive. We tested on a clean install of Windows XP and used three pairs of 1GB Corsair TwinX matched modules: Corsair's 6400C3 represents the low-latency crowd, the 8500C5 is the high clock-speed entrant, and a vanilla set of Corsair's DDR2 Pro 6400 modules rated for DDR2/800 and sporting latency values of 5-5-5-12 is our control RAM.

We selected several synthetic memory benchmarks, some synthetic gaming benchmarks, real-world games run at realistic resolutions, plus two popular image-editing applications to measure the impact of the different memory types.

In order to achieve the optimum clock speeds for the 1066MHz modules, we overclocked our 2.8GHz Athlon 64 to 3.04GHz, with the front-side bus running at 254MHz (stock speed is 200MHz). To generate a comparable CPU clock speed for the two sets of DDR2/800 modules, we ran the processor at 3.06GHz on a 204MHz reference clock. Due to the clock divisors on the Athlon 64's on-die memory controller, however, we couldn't exactly hit the rated speeds for the memory. The DDR2/800 modules ended up running at 764MHz and the DDR2/1066 modules were run at 1,016MHz. All memory settings were set manually in the BIOS.

AND THE WINNER IS...

In the pre-AM2 days of the DDR-only Athlon 64, low latency became a sacred cow to performance enthusiasts, who were willing to shell out up to 50 percent more moolah for memory that was a wee bit quicker. Our tests, however, show that in the AM2 world, latency isn't as important as we've been lead to believe. While the synthetic benchmark results give the edge to the higher-clocked, greater-bandwidth parts, the real-world applications and gaming tests are so close, you might as well call it a tie. That doesn't make it a complete stalemate, though.

Compared to our standard DDR2/800 modules with higher latency settings, there's a clear performance advantage when using either the lower-latency or higher-clocked parts. The mileage will vary depending on the application, but in *Premiere Pro 2* we saw a performance advantage of approximately 5 percent for both the low-latency and high-clocked memory parts, versus the standard DDR2/800 modules. In *Quake 4*, we saw a substantial 11 percent boost in performance for both schools of memory compared to the stock stuff. If maximum speed is what you're looking for, an extra $100 for a "faster" module might actually get you more performance bang for your buck than an extra 200MHz in your CPU. With that said, not every app really needs low-latency or high-bandwidth memory. Some applications, such as *Photoshop CS2*, just need a big fat hairy CPU to run fast.

What would we buy? With results this close, we'd actually go for the lower-latency RAM. You don't have to overclock to see the immediate benefits, and with its ability to pinch-hit as a higher-clocked part by relaxing the latency timings, low-latency memory is the more practical choice. MPC

SPEEDS & FEEDS

	TWIN2X2048-8500C5 (high clock speed)	TWIN2X2048-6400C3 (low latency)	TWIN2X2048-6400PRO (control set)
CPU CLOCK	3,048MHz	3,060MHz	3,060MHz
CHIP FRONT-SIDE BUS	254MHz	204MHz	204MHz
CPU MULTIPLIER SETTING	12x	15x	15x
RAM CLOCK	1,016MHz	764MHz	764MHz
LATENCY SETTINGS	5-5-5-15 2T	3-4-3-9 2T	5-5-5-12 2T
SISOFT SANDRA 2007 LITE BANDWIDTH (MB/S)	**10,228**	8,782	8,187
SCIENCEMARK 2.0 BANDWIDTH (MB/S)	**9,223**	8,173	7,754
3DMARK2001 SE OVERALL	**38,284**	37,593	37,019
3DMARK2005 OVERALL	11,162	**11,217**	11,185
QUAKE III 640X480 (FPS)	**635**	617	598
QUAKE 4 12X10 HQ NO AA (FPS)	**142**	**141**	127
FEAR 1600X1200 SOFT SHADOWS (FPS)	**47**	46	46
ADOBE PHOTOSHOP CS2 MPC SCRIPT (SEC)	265	**263**	265
ADOBE PREMIERE PRO 2.0 MPC (SEC)	**2,469**	2,508	2,580

Best scores are bolded.

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Neo HE consumes up to 20% less energy than standard power supplies

Advanced Cable Management System
Improves internal airflow and reduces system clutter by allowing you to use only the cables you need.

Universal Input with Active PFC
Use anywhere in the world without worrying about input voltages; Active PFC improves voltage stability and delivers environmentally friendlier power.

Power Supply Fan
One super-silent 80mm fan keeps the Neo HE cool and quiet at less than an 18dBA noise level.

Neo HE brings you a new level of confidence and power for your PC. Neo HE's specially designed circuitry with active PFC has an efficiency rating of up to 85%. This breakthrough in energy efficient design reduces energy waste and makes the Neo HE an extremely environmentally friendly power supply. The higher efficiency operation also means less heat generated in your system, keeping your components running cooler and helping prolong their operating life. And the advanced modular cable system lets you attach and detach internal power connectors as needed, giving the inside of your case a cleaner look along with increased airflow. Do your part for the environment with Neo HE; the premier choice for high-performance PC systems.

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Energy Efficient

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EXCLUSIVE CONTEST

BE A DEVELOPER FOR TWO DAYS!

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ATTENTION, SOLDIER! THE WORLD IS FULL OF BATTLEFIELD FANS WHO CLAIM TO BE #1...NOW WE'RE ASKING YOU TO PROVE IT. IF YOU CAN CONVINCE US THAT YOU ARE THE ONE, WE'LL BRING YOU ON AS A CONSULTANT FOR THE NEXT BATTLEFIELD PROJECT.

- Submit videos, screenshots, essays, whatever you can think of, and demonstrate how much you love Battlefield. Show us the greatest in-game frag we've ever seen, the slickest piloting ability, the total domination of your tank tactics. Make us gather around somebody's monitor in collective awe. The top 50 submissions will be posted for the public to vote on. The winner will be invited to serve as a consultant for the next Battlefield project!

- Headquarters is accepting submissions now. Visit http://battlefield2142-fan-search.gamesradar.com/ to upload your entry. You've got until October 15 to complete the mission. Now move out!

GRAND PRIZE WINNER

WILL BECOME A CONSULTANT WITH DICE ON THE NEXT BATTLEFIELD PROJECT. YOU'LL BE FLOWN TO SWEDEN TO WORK AND MEET WITH DICE FOR TWO DAYS. PLEASE VISIT HTTP://BATTLEFIELD2-FAN-SEARCH.GAMESRADAR.COM FOR DETAILED PRIZING INFORMATION AND COMPLETE CONTEST RULES.

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MAXIMUM PC's MORAL COMPASS

Do your computing activities fall on the side of righteousness or wrongdoing?

Famous Greek philosopher Socrates claimed that no one knowingly commits a wrong deed; that we are motivated to do good, although our actions might be perceived as bad or—more importantly—illegal by others. Thus it could be that some of the common computing tasks you carry out each day are actually considered ethically dubious or are even prohibited by law somewhere. For your enlightenment, we examine 22 of the hottest topics for debate. We'll not only tell you whether these computing practices are legal, but we'll also play armchair ethicist and weigh in with a morality scale based on our perception of the actual harm done to society. Let your own conscience decide where you stand!

Is it OK to download copyrighted material?

Only with permission, e.g., when you open a website in your Internet browser. Though you download the stories at Reuters.com into your browser, you can't copy them to your own site or newspaper and pass them off as your own—those words belong to someone else. This, of course, also applies to music. If an artist hasn't given you permission to download a song, and you do it anyway, you're in breach of copyright law. **Illegal!**

Moral Rating

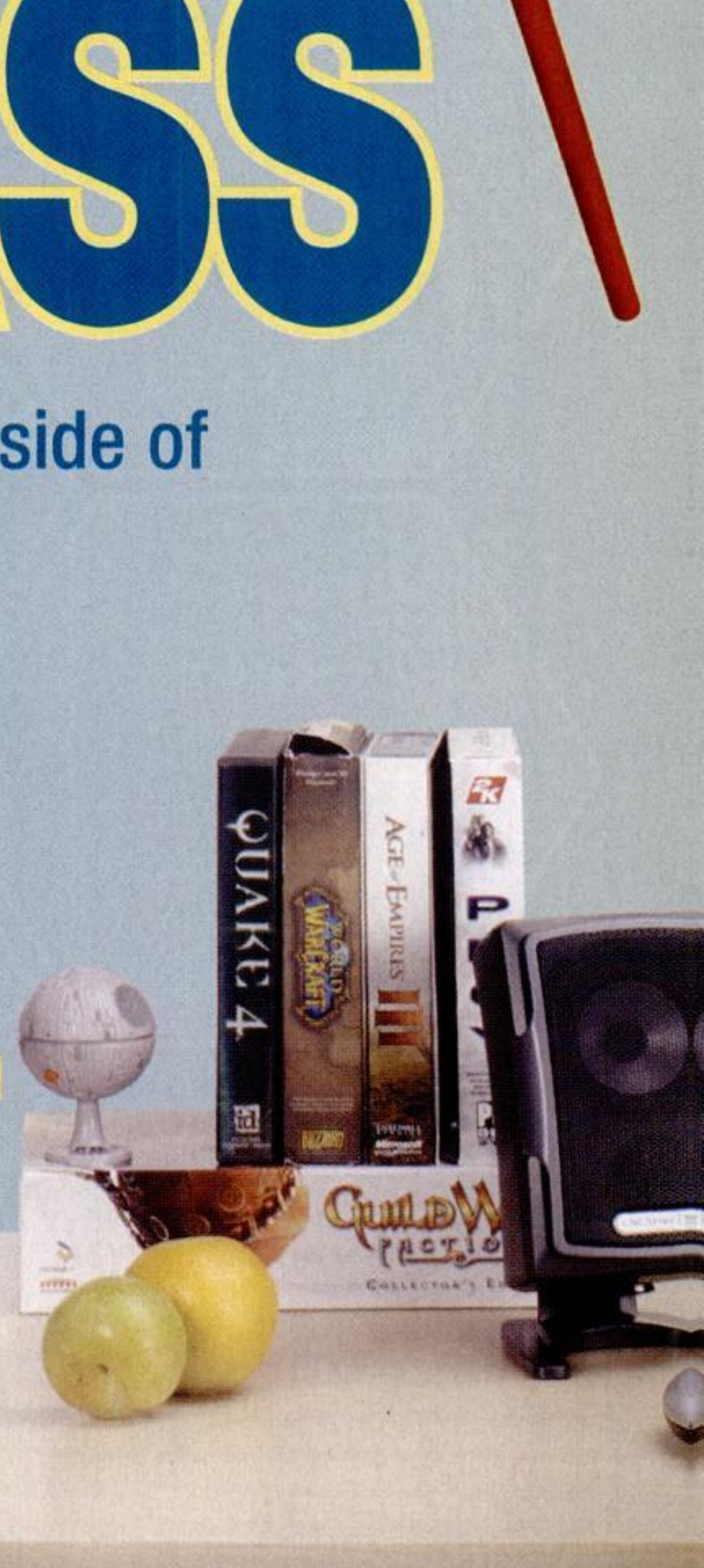
80% wrong

What about uploading copyrighted material?

Again, you can only redistribute copyrighted material if you have express permission to do so. This is where the majority of file-sharers get caught: While illegally downloading music via a P2P network is criminal, it's uploading the same music that's more easily convictable, whether you're making money from it or not. **Illegal!**

Moral Rating

95% wrong



PHOTOGRAPHY BY SAMANTHA BERG
ILLUSTRATIONS BY MARTIN ABEL

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Is it illegal to sample music and create mash-ups?
This falls under the same copyright laws addressed above: You can't alter a person's work without their permission. While you're generally allowed to sample a record for personal use, you'll need to get clearance before distributing it as your own work or making money from it. EMI issued DJ Danger Mouse a cease and desist order following his infamous and critically acclaimed Jay Z vs. The Beatles project, *The Grey Album*, despite the fact that Danger Mouse made only a limited number of copies for a few of his friends and didn't receive any money for it. **Illegal!**

Moral Rating

60% right

Is it wrong to reverse-engineer software?
Although the law surrounding copyright as regards computer programming is quite different from that governing other types of material, unless you have permission from the program's author, you can't touch it. Obvious exceptions include open-source programs, although the original author might request that you notify him or her beforehand. **Usually Illegal!**

Moral Rating

51% wrong

Well, at least they can't get me for cutting and pasting that bit of HTML, can they?
Uh… Unless otherwise specified, webpage source code is copyrighted material and as such belongs to whoever created it. If you copy code and use it on your own site without express permission, you are, in fact, breaking copyright law. **Illegal!**

Moral Rating

85% right

MAXIMUM PC's MORAL COMPASS

Is online plagiarism as big a no-no as plagiarizing a book or magazine?
Oh, yes. It might be harder to prove who the original author of the work is, but you must credit the author. If you want to sue an author who has plagiarized your work, remember: Copyright law covers the work that's expressing an idea, not the idea itself—that's covered by a different set of laws. **Illegal!**

Moral Rating

100% wrong

Is it acceptable to use the all-you-can-eat codec packages?
Downloading a package that features all of the media codecs under the sun and that enables you to run each and every one through *mplayer2* is a great saver of time and money. It's also illegal; however, the codecs included in the popular K-Lite Codec Pack have (allegedly) been reverse-engineered and KL Software doesn't even distribute files—it leaves that to mirror sites and P2P networks. **Illegal!**

Moral Rating

100% wrong

Can I install my copy of Windows XP on more than one PC?
Nope. Whether you purchase the upgrade version or the "new PC" version of Windows XP Home Edition, you get just the one license. Which means that you can only install that copy of Windows on one PC; install that copy of Windows XP on a second PC and you must uninstall it from the first. **Illegal!**

Moral Rating

96% wrong

Is recording TV transmissions to my PC legal?
The Supreme Court has specifically said that "time-shifting," where you copy a broadcast for viewing at a more convenient time, is allowed. **Legal!**

Moral Rating

100% right

Don't tell me spoofing my IP address is wrong!
Well, no, not really, but it's also not really as handy as it's made out to be. By spoofing your IP address, you're providing the computers you're sending data to with an incorrect address to reply to, so it's really useful only for one-way traffic, such as anonymous emailing. More useful would be a proxy server, which is designed to allow two-way, semi-anonymous communication. Unfortunately, using an anonymous proxy also slows things down noticeably. **Legal!**

Moral Rating

68% right

Can an MMORPG ban me because of my sexual orientation?
"Advertising sexual orientation is not appropriate for the high fantasy setting of the *World of Warcraft* and is therefore not permitted." That was Blizzard's warning to Sara Andrews, a player caught promoting a gay-friendly guild. "It's an absolute outrage and I simply will not tolerate it without a fight!" said Sara. Blizzard was rightly shamed, and the organization quickly backtracked and apologized to Sara, whose guild continues to thrive. **Illegal!**

Moral Rating

85% wrong

Can I rip CDs to my hard drive?

Strictly speaking, making a copy of anything you don't own the copyright to is illegal. There are exemptions for fair-use activities, such as making compilation tapes or converting tunes you've purchased legally into another format for playback on your iPod. But fair-use copies must be for your own personal use. As soon as you transfer legally copied materials to another person, you're in violation of the content producers' copyright, and in violation of the law. **Legal!**

Moral Rating

91% right

Copyrighted material

Keep your computer cool with new water cooler, RESERATOR 2

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MAXIMUM PC's MORAL COMPASS

Can, err, my friend really import a Russian bride?

As you'll learn from Russianladies.com, many of these potential paramours are incapable of communicating without the aid of a translator, but there's nothing legal stopping you from finding love online, whatever your intended's nationality.

However, the United States Congress is considering a bill that'll require any man searching for a foreign bride through an American site to undergo a full background check, after a Russian woman was murdered by her American husband in 2000. **Legal!**

Moral Rating

75% wrong

Encrypting my email isn't illegal, is it?

By encrypting your files and emails you are protecting them from prying eyes, but in the U.S. there's confusion about whether the state should have access to secret "backdoor" keys that would allow them to decrypt any email. The EU takes a more liberal view, stating in official reports that "privacy considerations suggest not to limit the use of cryptography as a means to ensure data security and confidentiality." **Legal!**

Moral Rating

100% right

It's OK to use abandonware, isn't it?

Websites like **www.theunderdogs.org** and **www.abandonwarering.com** offer games for download that were published by companies that are now defunct, as well as software that's more than five years old and no longer supported. But the availability of a game or program has no legal bearing on its copyright status; according to U.S. law, copyright remains in place for 70 years from the end of the year that the program was first made available to the public. **Illegal!**

Moral Rating

75% right

Are CD cracks and patches actually illegal?

According to U.S. copyright law, you're allowed to copy a program for the purpose of creating a personal backup, a condition that allows sites like **www.gamecopyworld.com** to continue operating. The site provides only "no-CD" cracks, and not CD keys, so it gives you the tools to run a game without its CD, but only after it's been installed from a legitimate copy first. ISO mounting apps, however, have had to be withdrawn, as they "allow the circumvention of certain copy protections," which is illegal in the U.S. **Legal!**

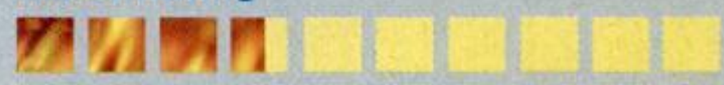
Moral Rating

85% right

Tell me more about ISO mounting tools.

Programs such as *Daemon Tools,* which enable you to mount ISO images saved on your hard drive as if they were physical CDs, have been around for years, but it's only recently that they've fallen afoul of the law. Originally intended for legitimate workplace use—allowing IT managers to distribute multi-license software among workstations without requiring a CD for each one—these programs have more recently been adopted by people downloading copied ISOs of games and applications via file-sharing networks. They're as legal as whatever you use them for. **Illegal!**

Moral Rating



64% right

I'm using my neighbor's wireless network for broadband. Is this against the law?

Provided you've got permission to use the connection—perhaps your neighbor is sympathetic to your financial situation, or you're chipping in some—we'll take a lenient view on this.

But the ISP in question won't be happy, and the person whose connection you're using will usually have signed an agreement to share the connection only with members of their household. So you're putting the account holder in an iffy position. But what the ISP doesn't know about, it can't complain about, right? **Illegal!**

Moral Rating

60% wrong

Copyrighted material

Are sites that post guitar tabs and song lyrics technically illegal?

Welcome to 2006's hot music-related topic. This time it's the U.S. Music Publisher's Association that's getting busy, taking sites that post unauthorized guitar tabs and song lyrics to court for breach of copyright. Even if the composer is credited on the site, unless the site owner has the specific permission of the composer to reproduce the lyrics and/or tabs, it's not allowed. **Illegal!**

Moral Rating

93% wrong

What do you agree to in an EULA?

What, indeed?! Grit your teeth and read through any EULA (end-user license agreement) and you'll be amazed at some of the terms you're agreeing to. Some classics of the genre include *Pinnacle Studio 9's* "You acknowledge and agree that in order to protect the integrity of certain third-party content, Pinnacle and/or its licensors may provide software security-related updates that will be automatically downloaded and installed on your computer. Such security-related updates may impair the software (and any other software on your computer which specifically depends on the Software) including disabling your ability to copy and/or play 'secure' content, i.e., content protected by digital rights management." Which basically gives Pinnacle the right to update *Studio 9* on your PC without your consent, and that by doing so, they're free to hobble it or other programs on your PC. Check out **www.eff.org/wp/eula.php** for more. **Legal!**

Moral Rating

73% wrong

Can I use other people's photos on my website?

You must have the photographer's express permission to use his or her work on your personal website and, if requested, you must credit the photographer as well. Failure to do so means you are technically infringing on the photographer's copyright, and he or she can sue. **Illegal!**

Moral Rating

73% wrong

If I'm ordained online, can I marry people?

Unless you're a member of the Universal Life Church (**www.ulc.org**), which has actually gone to court in the U.S. to achieve official recognition, no, you're not. Even if you are an ordained member of the ULC, New York City will still refuse to recognize you. **Legal!**

Moral Rating

90% right

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Stream Video from Your Webcam to the Internet

Want an easy way to keep an eye on your baby's crib? Wonder what your pets do when you're at work? With an inexpensive webcam and an old PC, you can create your own streaming video site!

TIME 02:05 HOURS:MINUTES

You know it and I know it: The moment you leave your house, your pets have a party. But the moment you return, they go right back to their mild-mannered pet personas. To catch them in party mode, you need a streaming video camera!

By connecting a typical webcam to an old laptop or PC running the appropriate software, you can set up a streaming video feed that you can access from anywhere on the Internet. It's easy to do and you'll be able to peek into your home from anywhere you have Internet access. We've even peeked in on our pooch from a cellphone.

Even though it seems like a fairly simple project, you'll need to muck around in the configuration screens for your router. Let's get started!

BY WILL **SMITH**

WHAT YOU'LL NEED

- **A USB WEBCAM, SUCH AS MICROSOFT LIFECAM VX-6000**
  $100, www.microsoft.com/hardware
- **TINCAM**
  $20, www.tincam.com
- **AN OLD PC OR LAPTOP**
- **BROADBAND INTERNET CONNECTION (WITH A STATIC IP ADDRESS)**
- **A WEBSITE YOU CAN UPLOAD FILES TO**

1 Prepare Your Streaming Server

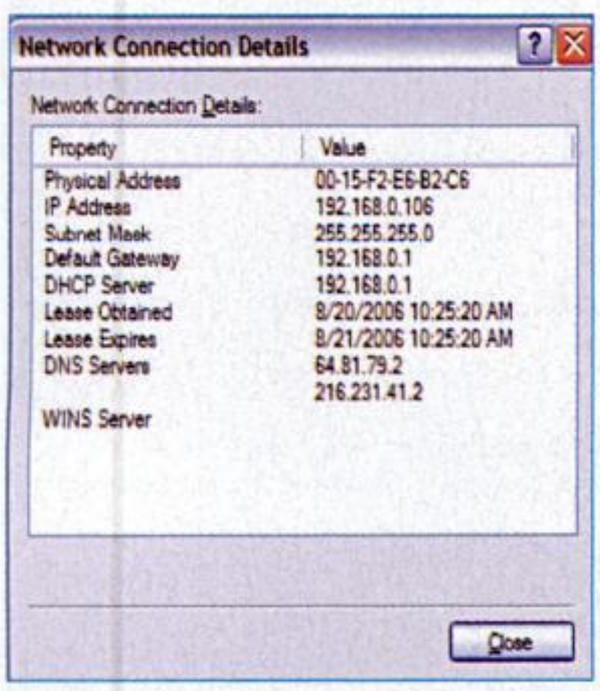
The first thing you'll need to do is configure the machine you're going to connect the camera to. You'll need to install the drivers and software for your webcam, install the streaming software, configure the machine to use a static IP address, and disable power management—you don't want the machine going into a power-saving mode.

To disable power management, open the Control Panel and go to the Power Options panel. Then make sure the System Standby option is set to Never. Make sure your webcam is working properly—most cams include an app that shows you the output.

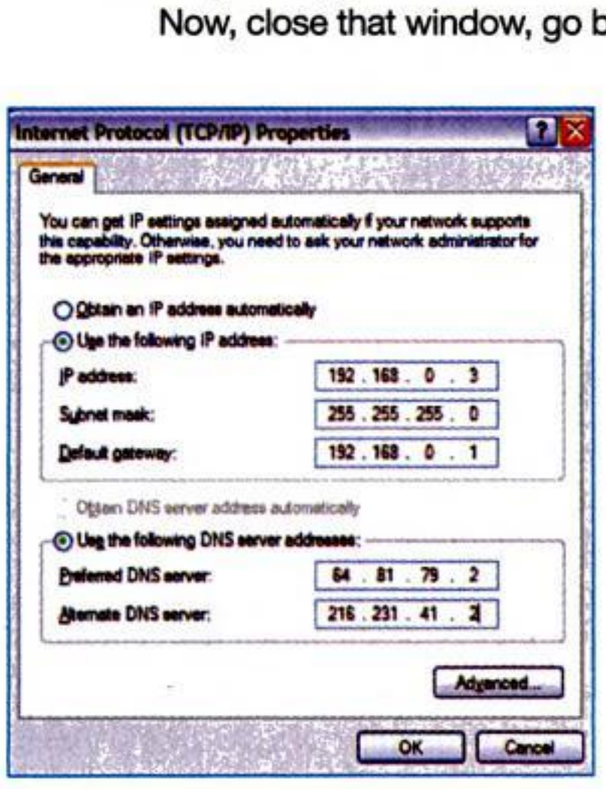
To configure your rig for a static IP address, the first thing you need to do is find the appropriate settings for your config. Go to the Control Panel, then click the Network Connections icon. Right-click your Internet connection—it will usually be called Local Area Connection—and click Status. Go to the Support tab and click Details. You should write down your current IP address, default gateway, and DNS servers; you'll need that info when you configure the static IP.

Now, close that window, go back to the General tab, and click Properties. Double-click Internet Protocol (TCP/IP). In the window that opens, you should click "Use the following IP address." This is where it gets tricky. To figure out your new static IP, you should look at the default gateway setting you wrote down before. Then add one to the final number in the default gateway (it's usually 192.168.0.1, so your new IP would be 192.168.0.2). Your subnet mask will be 255.255.255.0 and you can use the same default gateway and DNS servers you were using before. Press OK and close all the windows you just opened. If everything works and Windows doesn't give you an error, you can move on to the next step. If Windows says your IP is already in use, you'll need to try another IP address.

If you're using a software firewall on this machine, you'll also need to configure it to allow *TinCam* (the streaming app) to receive requests on port 8080, or the firewall will stop them. Consult your firewall's documentation for info on enabling port forwarding for a single app or port.



Before you can move your server machine to a static IP address, you'll need to get some info about your existing connection...


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 0 . 3
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
192 . 168 . 0 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
64 . 81 . 79 . 2
Alternate DNS server:
216 . 231 . 41 . 2
Advanced...
OK
Cancel

... then you'll manually configure your IP address using the info you just collected.

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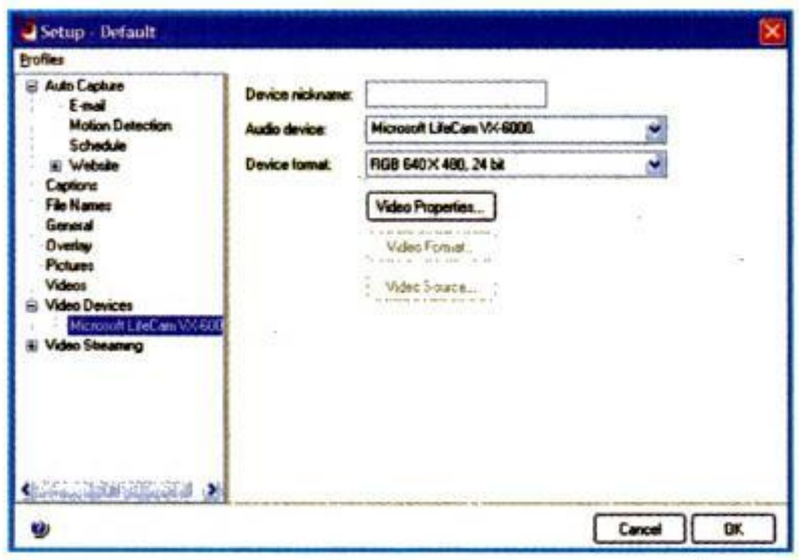
2 Configure TinCam

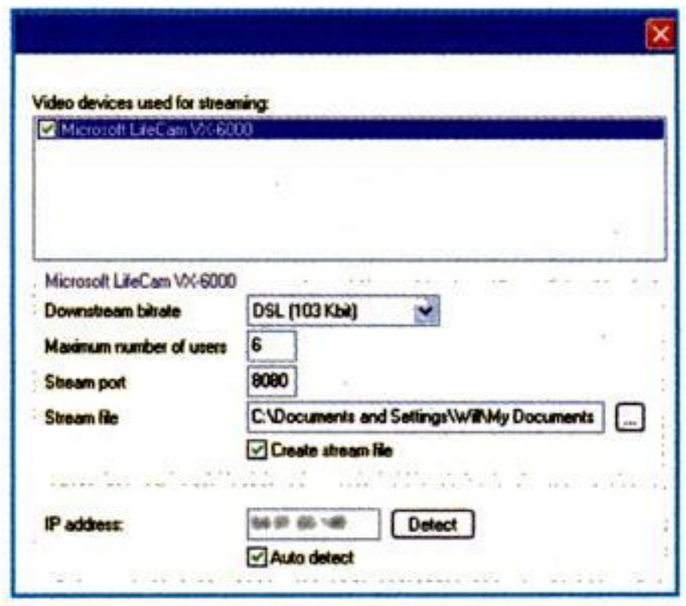
Open *TinCam*, and cancel out of the configuration wizard. The wizard helps you configure a webcam that posts a static image on the web, but we're going to be streaming video, so it's not necessary. Click the Setup menu and open the Setup option, then go to Video Devices and make sure the box for your camera is selected. Then click the sub-menu for your camera and configure its output format and the affiliated audio source (if you want to stream audio, that is).

This is also the pane you use to set the streaming resolution. The resolution has a direct impact on the number of clients you can stream video to. If you set it too high, your connection will only be able to support one stream. Too low, and you won't be able to see anything on your video. We recommend starting at 640x480, then testing the video outside your home LAN to see exactly how it performs. Of course, if you're only going to stream the video within your home, bandwidth is no object, and you'll be able to stream at the maximum resolution of your webcam.

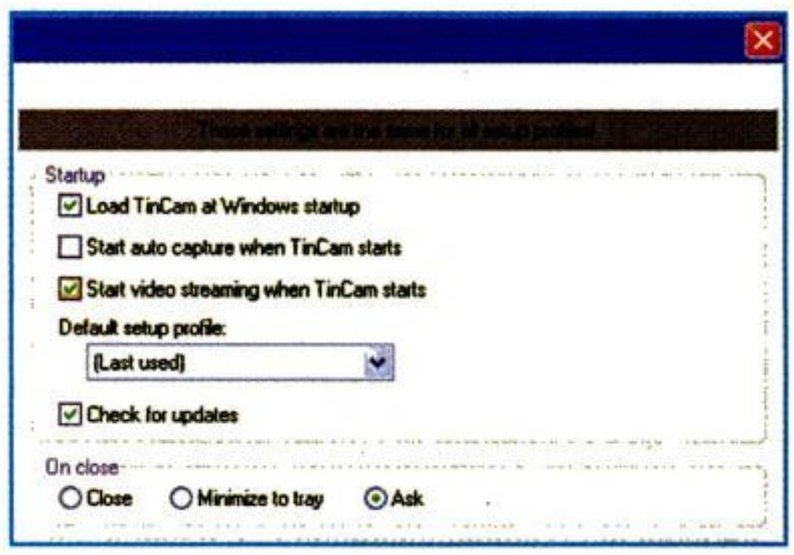
Next, you'll need to create the streaming file, which you'll need to upload to your personal website. This .wvx file contains the relevant information about your video stream—including the IP address, bit rate, and format—which lets software players find and connect to your server. Configure the downstream bit rate for your connection type (e.g. DSL, cable, T1) and the maximum number of users you want to support. Then click the Detect button to embed your IP address in the file, and make sure the Create Stream File box is checked. When you close the dialog box, the streaming file will be in the directory you specified earlier.



First you'll need to configure the resolution and color depth, as well as the camera you want to use (if you have more than one).



Then go to the Video Streaming tab and configure the specifics about your connection.



Once everything is working well, set *TinCam* to automatically launch with Windows.

3 Design Your Streaming Page

The nice thing about your streaming page is that it can be as fancy or simple as you like. The simplest thing to do is to make a link to the .wvx file (created in Step 2) on your website. This is the code we used on our webpage:

```
<a href="http://www.url.com/webcam.
wvx">Webcam</a>
```

Simply make a link to your file, and you can view your streaming feed in *Windows Media Player.*

Of course, you'll need to replace `www.url.com/webcam.wvx` with the path to your streaming file.

If you want your own streaming page to look a little fancier, use *Notepad* or your favorite HTML editor to create the page, just like you would for any other webpage, and embed this code where you want the video player to show up:

```
<OBJECT ID="MediaPlayer0" WIDTH=640
HEIGHT=525
CLASSID="CLSID:22D6f312-B0F6-11D0-94AB-
0080C74C7E95"
STANDBY="Loading Windows Media Player com-
ponents..."
TYPE="application/x-oleobject">

<PARAM name="autoStart" value="True">
<PARAM name="filename" value="webcam.wvx">

<EMBED TYPE="application/x-mplayer2"
SRC="webcam.wvx"
NAME="MediaPlayer0"
WIDTH=640
HEIGHT=525>
</EMBED>
</OBJECT>
```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4 Configure Your Router

Next, you need to configure your router to forward connections from the net to your streaming server. The details will vary from router to router, but the basic steps are the same. First, you need to access your router's web interface. Open your browser and type the IP address you wrote down earlier for your default gateway—your router is your gateway. Enter your router's password when prompted, and then look for a page labeled Port Forwarding, Gaming, or Servers.

Regardless of your router's brand, you'll need to configure a port to forward, as well as tell the router which type of traffic to pass through, and the destination on your internal network. The port range will be 8080 to 8080, the IP address will be the static IP you assigned in Step 1, and you should forward both TCP and UDP packets. Make sure your new forwarded port is enabled, click the button to apply your settings, and you're done with the router config.

Port Range Forwarding | Port Triggering | DMZ | QoS

Port range					
Application	Start	End	Protocol	IP Address	Enable
remote desktop	3389 to	3389	BOTH	192.168.0.5	☑
squeezebox	9000 to	9090	BOTH	192.168.0.5	☑
squeezebox	3483 to	3483	BOTH	192.168.0.5	☑
ftp	21 to	21	TCP	192.168.0.5	☑
	0 to	0	BOTH	192.168.0.0	☐
	0 to	0	BOTH	192.168.0.0	☐
http:	80 to	80	TCP	192.168.0.5	☑
webcam	8080 to	8080	BOTH	192.168.0.118	☑

You must tell your router that it's OK to forward requests from outside your LAN to your streaming media server.

6 Upload and Test Your Stream

Now you'll need to upload the stream file you created in Step 2, as well as the HTML file you created in Step 3, to your website. It's a good idea to put these in a subfolder of your public_html directory. That way, you can easily add a password to the subfolder, to give your cam minimal protection from prying eyes.When the files are uploaded, go to your streaming server, open *TinCam*, click the Capture menu, and then select Video Streaming. Your stream should be live at this point. Browse to the page you uploaded, and check it out! MPC

If everything works, you'll be able to browse to your page, connect to the video stream, and see... well... whatever you pointed your cam at.

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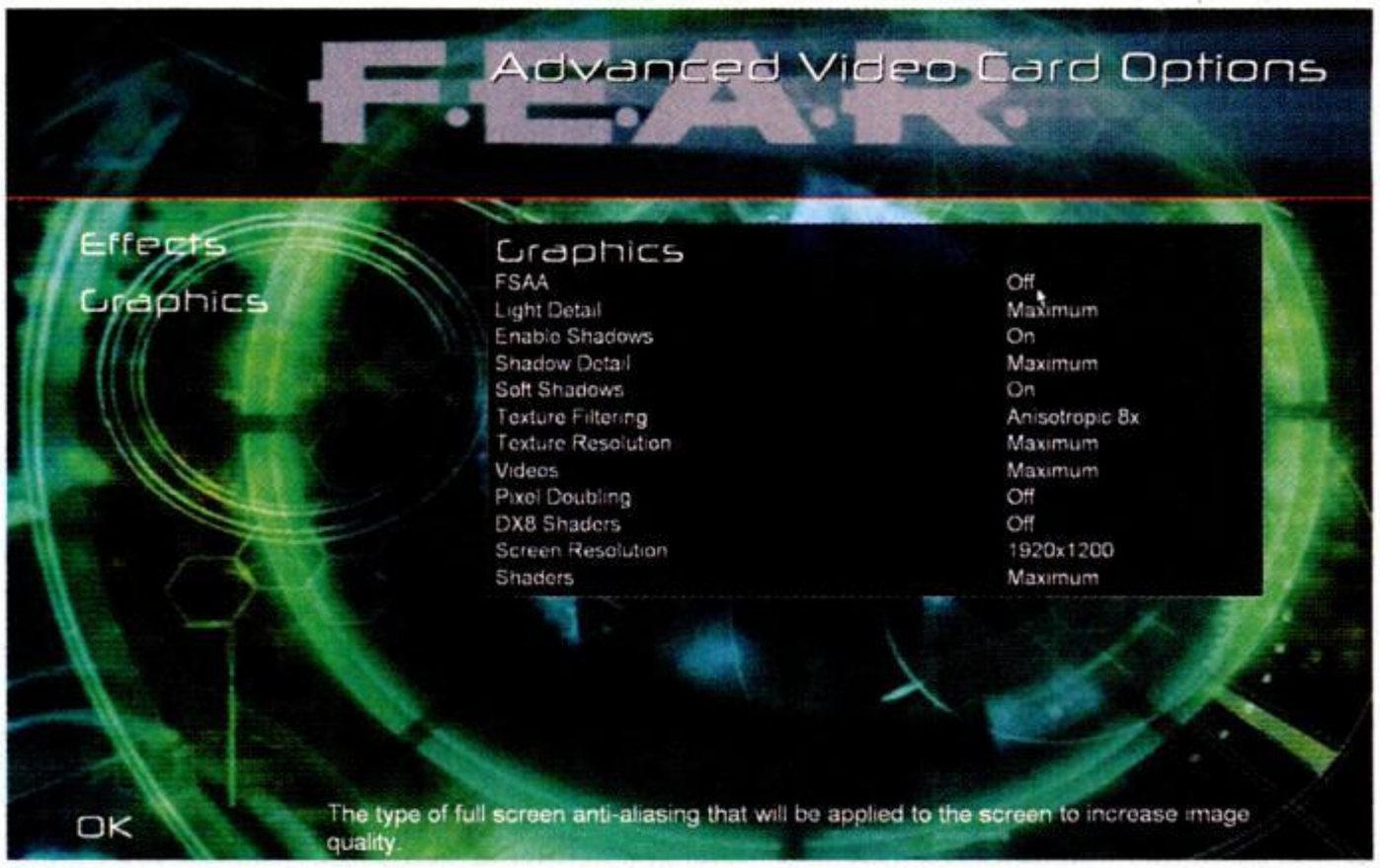
Ask the Doctor

Diagnosing and curing your PC problems

FEAR NOT

*I just recently built my dream machine. I've got an Asus A8N32-SLI Deluxe mobo with an AMD Athlon X2 4400+, 2GB of Corsair DDR, and two EVGA 7800 GTX videocards in what I thought was SLI mode. The only problem is, when I run the **FEAR** demo with all the video options set to maximum and SLI turned off, I get 26fps. But when I turn on SLI, I get only 27fps! That doesn't sound like the massive performance gains everyone is attributing to SLI. I lowered the display options to the minimum and tried it again, just in case the game was amazingly too much for the cards, and I still got only 67fps with SLI turned off and 69fps with it on. Am I missing something, or did I just waste my money?*

—Matthew Marcus



Running *FEAR* on an nVidia videocard? You can enable full-screen antialiasing or soft shadows, but not both.

You don't say what resolutions you're running the game at, but because you do indicate that you have "all the video options set to maximum," there's a chance that the cause of your performance discrepancy is a documented bug in the program. Basically, you shouldn't run the game with both soft shadows and full-screen antialiasing at the same time. If the nVidia display control panel indicates that SLI is enabled, but you feel as though you're not seeing the performance boost you should, turn on GPU Load Balancing and launch *FEAR*. When SLI is operational, you'll see one of three signs: A thick vertical green bar moving up and down the left side of the screen indicates that Alternate Frame Rendering is operational, a thin horizontal green line moving up and down the screen indicates that Split-Frame Rendering is active, and a thin horizontal green line stretching partially across the screen tells you that SLI antialiasing is running.

A POLK IN THE EYE

*I built a gaming rig that includes an X-Fi XtremeMusic soundcard, which supports SPDIF in/out. Rather than investing in a new speaker system, such as the M-Audio LX4, I wanted to use my Polk Audio surround-sound speakers and Kenwood A/V receiver. In addition to saving some cash, I figured these speakers would outperform any PC speakers—including M-Audio's. I connected the X-Fi to the Kenwood with a digital coax cable and configured the X-Fi control panel to use a 5.1-channel setup and an external decoder. I then fired up **Battlefield 2**, fully expecting to hear the Army roll into my living room. To my disappointment, I didn't get any sound from the rear speakers. What do I need to do to get surround sound out of this configuration?*

—Thomas Kischke

There's a solution for your problem, and it won't cost you much *if* your A/V receiver has six discrete, analog surround-sound inputs. Acquire three sets of cables that have 1/8-inch stereo plugs at one end and two RCA plugs at the other. Plug the 1/8-inch connectors into the X-Fi, plug the RCA connectors into your receiver, and configure the X-Fi to handle the decoding. If your receiver doesn't have these inputs, you'll need to buy another component for your rig: Creative's Home Theater Connect DTS-610. Connect the analog surround-sound output from the X-Fi to the DTS-610, and then route the digital output from the DTS-610 to your A/V receiver using either an optical or coaxial digital-audio cable.

You should remember, however, that your Polk Audio speakers are designed to fill a living room with sound. If you're sitting closer to the monitor while playing games than you are while watching movies, you'll be out of the speakers' sweet spot and you might not get the surround-sound experience you're hoping for. Speakers such as the LX4 are specifically designed for near-field listening, so you can sit up close.

WHEN 'FREE' CAN COST YOU

I'm on the road several months a year and like to access the Internet. A lot of motels are adding or switching to unsecured wireless connections. How much information can be captured over these networks? If I use my eBay password or log into my online banking account, can someone capture this data? What about credit-card numbers on a secured connection? Should I limit my surfing to news and adult entertainment?

—Fred Gabbard

It's a trivial matter for anyone to intercept any unencrypted data traveling over any unsecured wireless network—that includes any email or instant messages you send and receive, any user log-ins or passwords you

Continued on page 58→

The Doctor has cured thousands of tech ailments over the years. Seek his counsel by sending an email to **doctor@maximumpc.com.** The Doc also offers this seasonal and decidedly non-technical advice: People who don't vote have no right to complain about the outcome.

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Ask the Doctor

Continued from page 56

type on your laptop, and a whole lot more. And if the hotspot provider hasn't configured its wireless access point to prevent client-to-client communication, anyone else on the network can gain access to the contents of your hard drive.

Here are few ways to protect yourself: Disable your wireless adapter's radio when you're not using it. Install a firewall, turn off file and printer sharing, and disable your client for Microsoft Networks to prevent anyone from gaining access to your hard drive. Don't type user names, passwords, credit-card numbers, or any other sensitive data on any website unless the site uses SSL technology (the URL will begin with https, instead of http). The same goes for accessing email using a web browser. Don't be lulled into complacency if the service provider offers an easily cracked security solution, such as WEP. And be careful about surfing those adult-entertainment sites—the Doc's heard they can make you go blind.

BRING ON DA NOISE!

I bought a PNY 6800 GS 256MB AGP graphics card, and I like the way it works; but man, it sounds like a vacuum cleaner stuck on high. Is there any way to dampen the noise? It's killing me, and if I can't take it down a notch, it has to go!

—Bob Lee

You might consider installing an after-market cooler. We really liked Arctic Cooling's Accelero X1 when we reviewed it last May (you'll find the full review at MaximumPC.com). You might also consider moving up to the 7800 GS AGP. We've not reviewed the AGP version of this card, but the PCI Express model is sweet and very quiet.

THE HOST WITH THE MOST

I want to start hosting games on my PC, but certain games ask for certain ports to be open. Is there a book or website that explains how to do this? I'd also like to know which factor has the biggest impact on server performance. Is it CPU speed, videocard speed, or the amount of system memory?

—Ralph Urrea

The method for opening ports depends on which router you're using. Router manufacturers use different labels to identify the configuration screen you need to access: Some call it "Applications and Gaming," others describe it as "Servers," and still others call it simply "Port Forwarding." You'll need to consult your router's documentation to find out how to enable port forwarding. If you don't have the manual, you'll likely find a copy of it on the router manufacturer's website. Before you configure port forwarding, however, you'll need to assign your server an internal static IP address. If the server's IP address is assigned dynamically, your forwarded ports could point to the wrong machine the next time your router doles out new addresses.

If the machine is to function as a dedicated server—and it should if you intend to host a large game—its CPU and system memory will be its most vital components; the quality of its videocard will be largely irrelevant. What's even more important, however, is the amount of available bandwidth between the server and the Internet. Depending on the game, the server can absorb 50- to 100Kb/s of bandwidth *per connected client*. At that rate, a server with a typical home DSL connection is capable of hosting only three to six clients; most cable connections can handle even fewer. But if you're lucky enough to have a very high-speed Internet connection—such as Verizon's fiber-based FiOS—you might be able to host a 32-player server with no problems.

ANOTHER FINE MESS

*I recently upgraded my system to an Asus P5WD-2E Premium motherboard, but my burners don't seem to be making the transition well. My Pioneer DVR104 says it has installed the drivers, and I enabled the "use DLA" option on the drive's properties menu, but none of my software can write to it. **Nero 6** gives me a "SCSI command aborted" message, even though the drives are attached to the mobo's secondary IDE connector. The HP 640c driver installation complains that it "could not find a suitable IDE controller," and when I downloaded the latest driver from HP's website, it reported "no device found." How should I proceed?*

—John Maciula

You don't say which motherboard you upgraded from, but it sounds as though you plugged your existing hard drive into a motherboard that uses a chipset that's different from the one you had before. The ailments you describe indicate that you either haven't installed drivers for your new chipset, or that you've installed new drivers on top of the old ones. Windows gets very confused when its software environment doesn't jibe with its hardware landscape.

The Doc usually prescribes reinstalling Windows after a motherboard transplant (first save any crucial files to another drive or partition). You can get away without a reinstall once in a blue moon, but typically only in situations where both motherboards are based on the same chipset. If reinstalling Windows is anathema, you could try downloading the latest chipset drivers, uninstalling the existing chipset drivers (using the Add/Remove Programs tool in Windows' Control Panel), and then installing the correct drivers. But if that doesn't work, you won't have much of a choice. MPC

SECOND OPINION

I have another suggestion for the problem that Patrick Patton described in your September issue ("Call of the Blue Screen"), because it sounds very similar to something I suddenly encountered with a high-end, home-brew system that had been working fine. All of a sudden, I started getting blue-screens with "IRQL_NOT_LESS_OR_EQUAL" messages. Being an experienced sleuth, I scrubbed my drivers, rolled back to previous versions, and even tried new beta versions—all with no love.

I then noticed that my videocard and soundcard were using the same IRQ, so I moved my soundcard to a different PCI slot. That resolved the IRQ conflict, but I was still getting BSoDs. It finally dawned on me that I had installed an older game that used StarForce copy protection. I opened Windows' Device Manager, clicked "Show hidden drivers," and disabled all the StarForce drivers. *Call of Duty 2*, as well as all other non-StarForce-protected games, worked fine after that. This also solved some problems I'd been having with my optical drives.

—Chad Greiner

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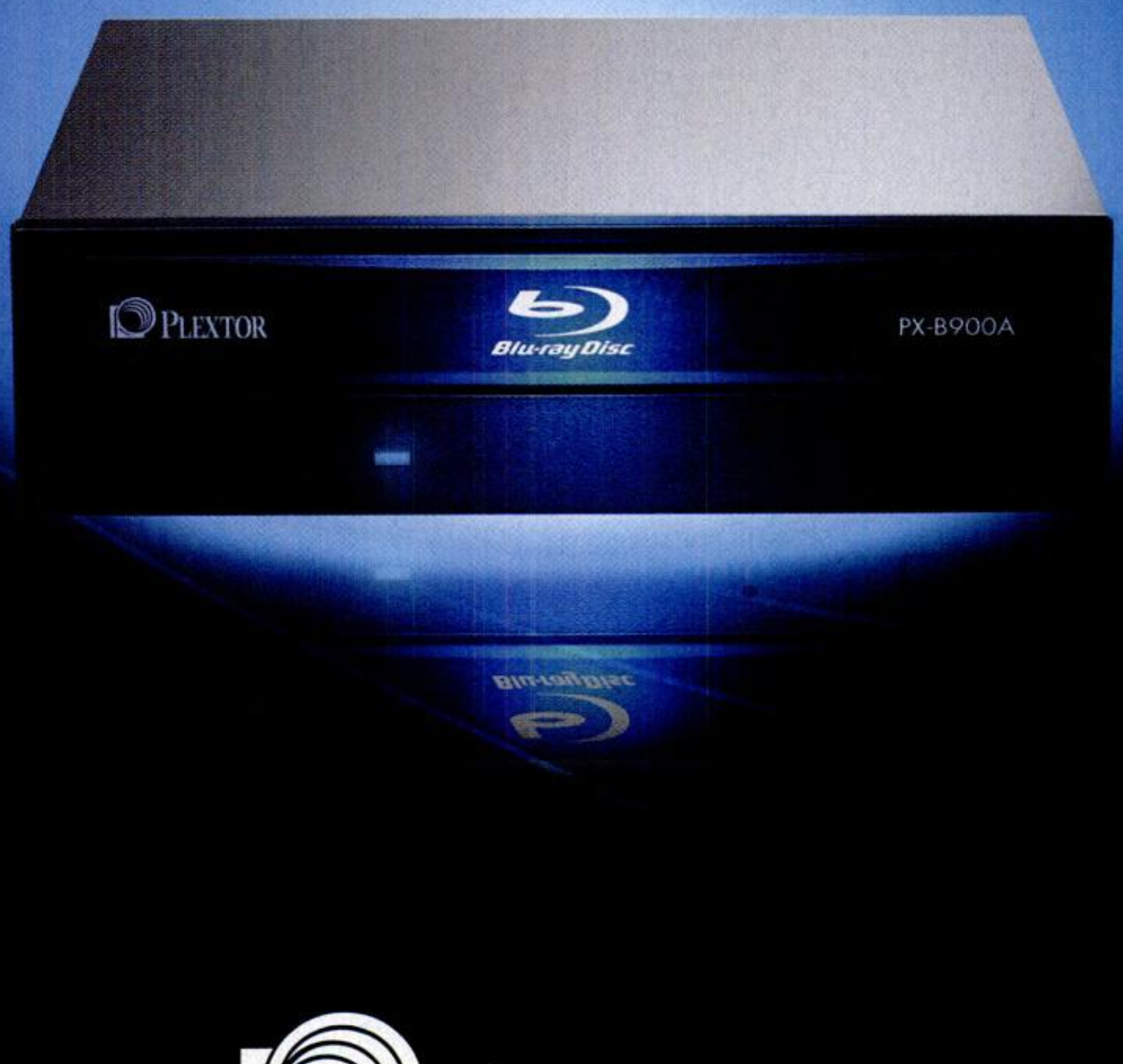

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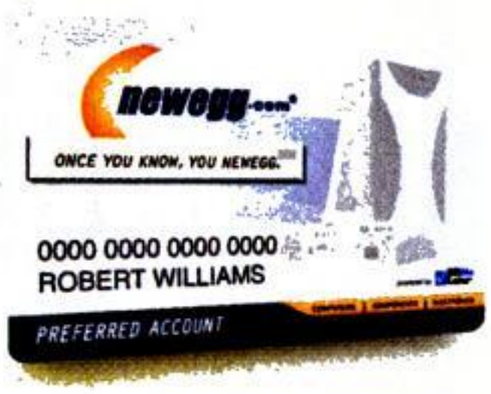

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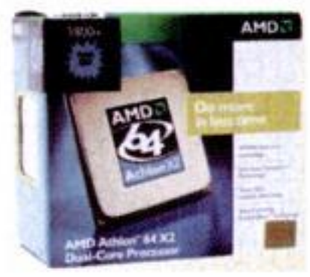

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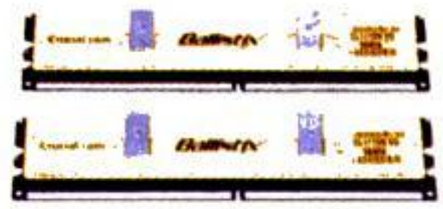

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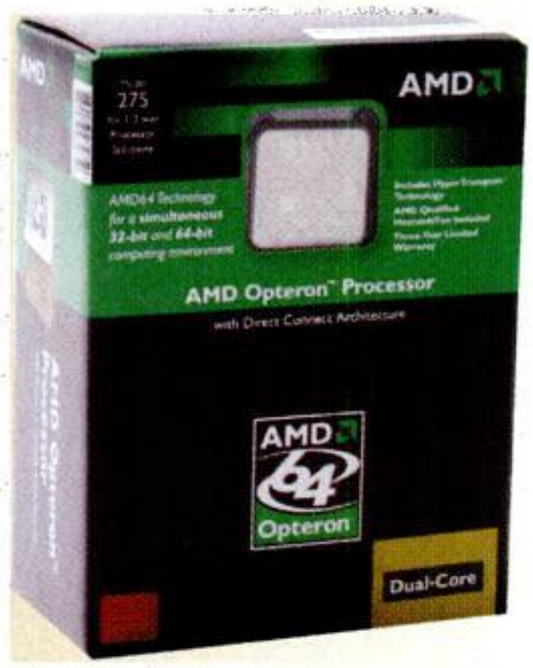

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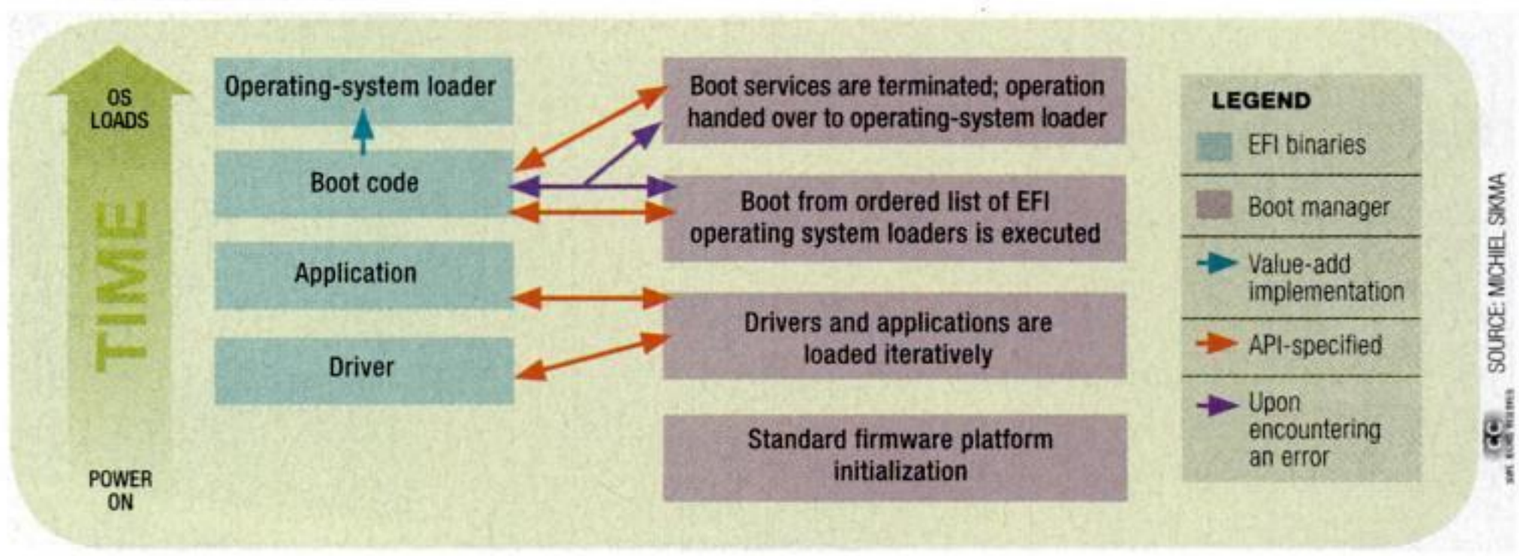
White Paper: A Brave New BIOS

BIOS technology hasn't evolved much since its introduction in the first IBM PC. UEFI (United Extensible Firmware Interface) is about to change that.

BY GORD **GOBLE**

HOW IT WORKS **The UEFI boot sequence**



UEFI steps in when the system BIOS has finished. It will load device drivers, but it can launch simple applications, too. You might configure it to automatically go online, download, and install driver updates, for example. Once that's done, UEFI will start up the operating-system loader, giving you a choice of several OSes. Once you've made your choice, the OS is loaded and takes over. Source available at MaximumPC.com.

Your computer becomes a very busy place the moment you press the power switch. In the moments before your operating system's splash screen appears, your PC performs diagnostic tests to ensure that critical hardware components such as hard drives and videocards are working properly. It confirms that your memory is ready. It verifies that external devices such as keyboards and monitors are connected and functional. It checks the ports and the buses to make sure data flows smoothly. And it warns you if it finds anything amiss.

Your computer knows how to do all these things even before its operating system has come to life, because of the presence of its BIOS (basic input/output system). Safely ensconced on the motherboard within nonvolatile flash memory, the BIOS springs into action as the PC powers up. BIOS instructions are often referred to as firmware because they don't need to be loaded into memory before they're executed.

As old as it is essential, BIOS architecture is long overdue for a fundamental overhaul. We've gone through five major generations of Microsoft operating systems (DOS, Windows, Windows 3.1, Windows 98, Windows XP) and we're poised to move to a sixth—Windows Vista—but BIOS architecture hasn't changed much at all. It still relies on the 16-bit interface of x86-style CPUs. And it has very limited memory space—just 128 kilobytes—in which to execute the option ROM firmware that's stored on expansion cards; this severely limits the number of cards that a system can host.

BIOS enhancements have been few and far between, with each improvement being laid atop the antiquated foundation of the original. The technology moved away from unalterable ROM (read-only memory) chips to a storage medium that allows for changeable settings and that can be flashed with entirely new versions. Because the underlying technology hasn't changed, tweaking your BIOS remains fraught with danger for users who aren't educated and careful. Updating your BIOS incorrectly—or just encountering a power outage during the flash process—still holds the potential to kill your motherboard.

A NEW FOUNDATION

UEFI (United Extensible Firmware Interface) will finally and fundamentally change the PC's BIOS architecture—removing its limitations and making it safer to manipulate—but it won't do away with it. First conceived at Intel in 1998, where it was known as the Intel Boot Initiative, UEFI remained stuck in the development stage for several years.

In 2005, however, Intel formed a consortium—the UEFI Forum—whose mission is to promote and manage a UEFI standard and to ensure its industry-wide adoption. With a membership roster that includes Intel, Microsoft, AMD, Dell, IBM, and HP, the forum is an indication that UEFI is here to stay.

So what exactly is UEFI? The UEFI Forum describes it as "a specification detailing an interface that helps hand off control of the system for the pre-boot environment to an operating system." If you think that sounds like a convoluted description of BIOS, you're not far off the mark. And while the benefits that UEFI offers aren't earthshaking, they are both practical and substantial.

A BETTER BIOS

UEFI supports a high-resolution graphical user interface (GUI), so you'll no longer be left staring at crudely rendered text while configuring your PC's pre-OS environment. It ensures that custom boot-device combinations will be successful more often, and it's unencumbered by any special hardware requirements. It delivers faster boot times than BIOS—a factor that's especially important to servers and power users—because it's not saddled with BIOS' circuitous code path (the result of 25-plus years of tweaking). And UEFI was designed from the ground up to work with both 32- and 64-bit operating systems, yet it's backward compatible (through emulation) with operating systems designed for BIOS.

Because UEFI is written in the C programming language, it can be revised and upgraded using standard programming tools. BIOS is written in assembly language, rendering it much more difficult for programmers to get their heads around. The UEFI application programming interface (API) makes life easier for programmers, too. By eliminating the need to address the compatibility and maintenance issues associated with legacy firmware, developers will need less time to design new PC products. And in theory, manufacturers will need to develop just one device driver for all UEFI computers, no matter which operating

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system the machine winds up booting.

Contrary to speculation, however, the PC industry's adoption and implementation of UEFI won't entirely do away with BIOS—at least not in consumer-level Windows-based computers. Although this new technology will handle or delegate most BIOS chores, UEFI still relies on low-level firmware for some things, including POST (power-on self test).

This is necessary because the consumer PC market is anything but standardized. Motherboard manufacturers can choose from numerous CPU architectures, core-logic chipsets, memory types, I/O devices, LAN controllers, and more. Then, with the assistance of a BIOS vendor such as Phoenix or AMI, they develop the specific firmware that's required to kick-start that particular collection of hardware into action. It would be impossible to design firmware flexible enough to take into account every possible permutation of motherboards and motherboard components in today's market.

The UEFI development team, however, is hard at work on technology that should change that equation in the future. The consortium's Platform Initialization Architecture is designed to handle the type of firmware-to-silicon interface that the BIOS provides today.

SO WHEN WILL IT BE HERE?

Despite its many benefits, it will be some time before any form of EFI becomes a common element in consumer PCs. Microsoft's participation in the UEFI Forum notwithstanding, the company reversed course earlier this year and announced that the launch version of Windows Vista will not support booting from any EFI, including UEFI; in fact, the 32-bit version of Vista will apparently *never* support booting from an EFI.

A Microsoft spokesperson told us the company expects its first support for EFI boots "... will come with the release of Windows Server 'Longhorn,' which is expected in 2007. We also expect to support native EFI boots on 64-bit Windows Vista systems in the future, although this will come after the product launches."

But Microsoft apparently isn't the only reason for UEFI's slow adoption; system manufacturers are reportedly leery of the technology because it represents an added expense that could further erode their already razor-thin profit margins.

The road to UEFI may be long, but we're sure it won't end in a cul-de-sac. UEFI is already the pre-OS firmware of choice for servers based on Intel's Itanium CPU. More importantly, Apple's Intel-based Macintosh computers use this technology, too. Surely the PC industry won't cede such an advantage to Apple for long. MPC

Surge Protector

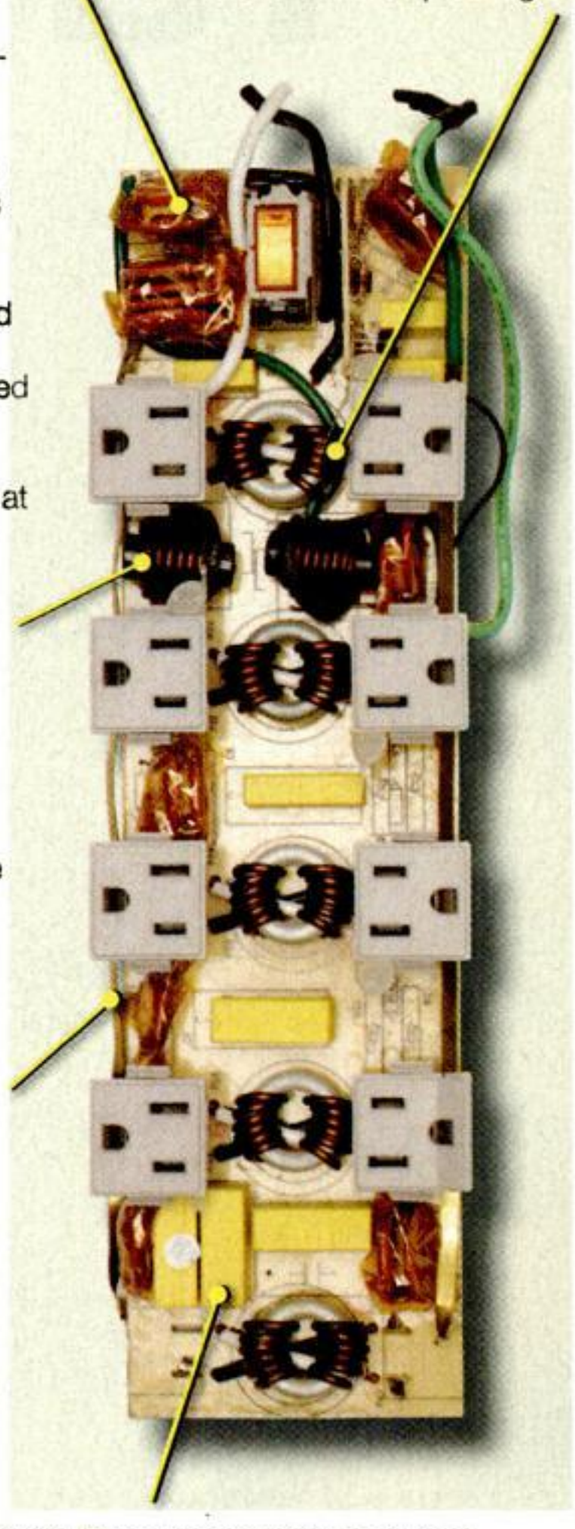
Have you ever wondered what separates a surge protector from an outlet strip—aside from the price tags? We busted open this Belkin model to find out.

MOVS: The acronym stands for metal oxide varistor, and each is rated to allow only so much voltage to pass through it. When a surge—a sudden and brief increase in line voltage—encounters a MOV, the MOV clamps the voltage and dissipates it as heat. A surge suppressor's ability to dissipate heat—and thus handle power surges—is measured in joules. This unit has 16 130-volt MOVs and is rated at 4,720 joules.

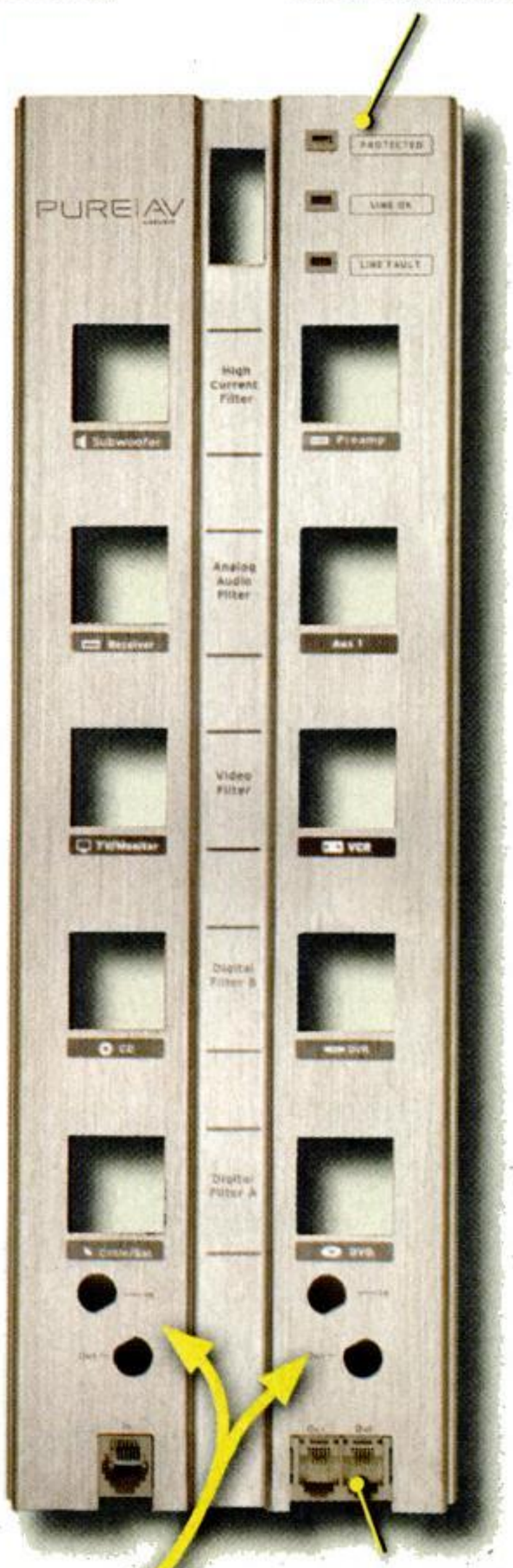
NORMAL MODE INDUCTORS: These ferrite rods wrapped in copper wire filter out high-frequency noise present in the power and neutral lines (there is one for each).

BUSS BAR: This brass bar runs along each side of the strip and serves to interconnect the grounding pin on each outlet, providing a low-impedance path to ground.

COMMON MODE FILTER: Also known as "chokes," these components block high-frequency signals appearing on the line and neutral input wires. This unit has five filters, one for every two outlets, to isolate the noise generated by connected equipment. (Note: we broke two outlets off the end of the strip during the autopsy.)



SHELL: This strip's shell is fabricated from extruded aluminum.



FILTER CAPACITORS: These components are used in conjunction with the common mode filters to reduce high-frequency noise on the power lines.

RJ-11 JACKS: These phone jacks are protected by a solid-state surge suppressor generically known as a SIDAC (silicon diode for alternating current). A transient surge on the incoming phone line switches the SIDAC on, which directs the surge to the protective ground connection.

RF MODULES: These connectors are used for coaxial cable, such as would be used with cable- or satellite TV or an antenna. They use a gas-discharge tube for surge protection, so as not to affect the quality of the incoming signal.

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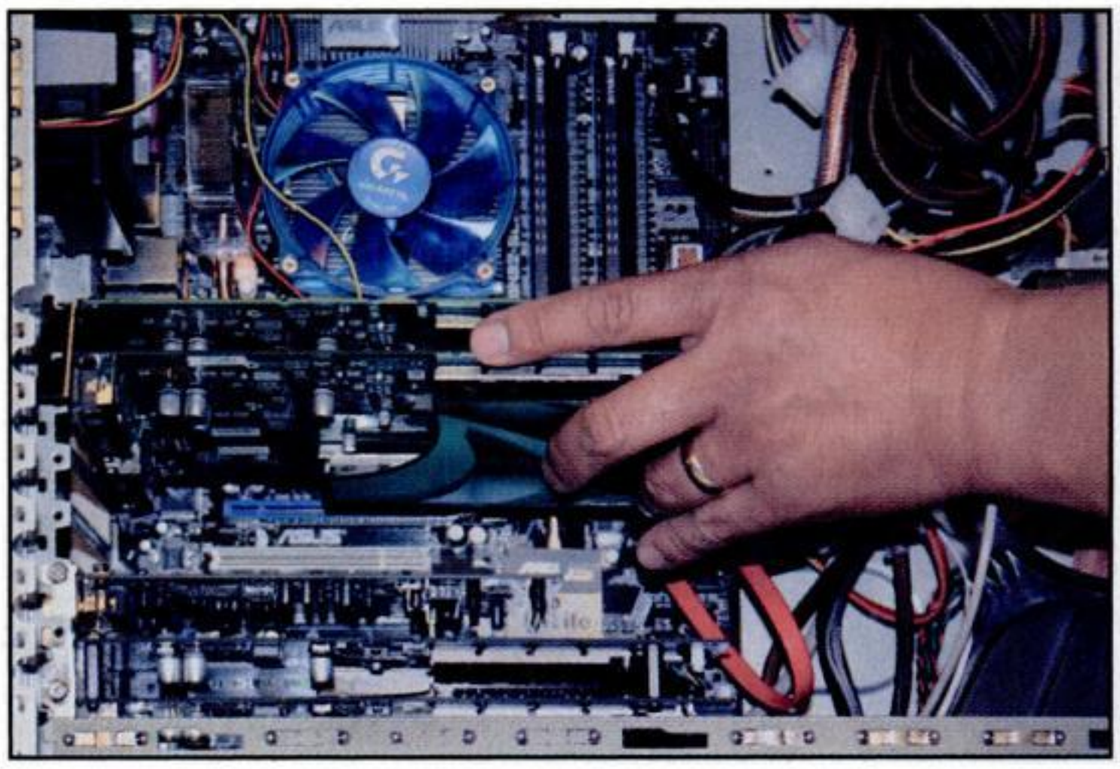
Tests DIY Quad SLI

Building a quad-SLI rig isn't like building an SLI machine. Is it even worth mucking around with?



nVidia has finally released drivers that will let DIYers build their own quad-SLI machines with GeForce 7950 GX2 cards.

Our first romp with nVidia's quad SLI, back in the July issue, was less than stellar. The original incarnation of quad, using GeForce 7900 GX2 cards, simply wasn't ready for prime time. The cards were too big and the drivers were like a cake left in the rain.

The 7900 GX2s were so tricky to build with that nVidia designated quad SLI an OEM-only option, fearing end-users couldn't handle the complexity. And no wonder: The original "longboard" 7900 GX2s were so massive that they brushed up against hard drives in many enclosures. The 7900 GX2 cards also required two SLI bridges, not to mention *four* separate six-pin PCI-E power plugs from your PSU. And the massive heatsinks made the cards extremely heavy. To make matters worse, nVidia had headaches with the way some mobos incorrectly configured the PCI-E lanes.

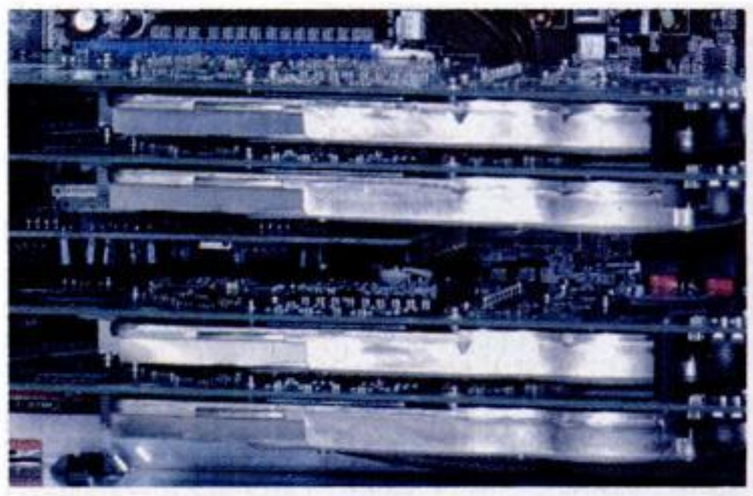
Fast forward six months and you get rev 1.5 of quad SLI with the GeForce 7950 GX2. The card is smaller, lighter, and internally bridged, so you only need a connector between boards for a quad config. With most of the motherboard and driver issues fleshed out, nVidia has finally decided to remove the velvet rope and give DIYers access to quad. That doesn't mean it's a snap to do, though.

To do quad SLI right, there are four main points to pay attention to: PSU, drivers, mobo, and thermals. You'll need a beefy PSU that provides at least 700 "real" watts, and preferably one that's certified by nVidia to work with quad SLI. You'll also need to verify your motherboard's compatibility. This info is buried in SLIzone.com, but if you visit **www.nvidia.com/content/geforce_gx2_sbios/us.asp?vendor=all&sortBy=chipset**, you can see if your mobo is approved and determine which BIOS you'll need. The short story is that if your mobo works with a single GX2 and supports SLI, it should work with two such cards.

Driver support is also of paramount importance. At press time, the beta 91.33 drivers on Nzone.com work with quad SLI—*shhh*, it's a secret—but nVidia recommends that you use the beta 91.45 drivers, which are *only* available at SLIzone.com and work only with the GX2 cards.

Finally, we recommend that you pay close attention to thermals with quad SLI. The GX2 cards are slightly hotter than the single-GPU cards, which themselves don't run chilly. If you're running a high-powered SLI rig, you need to get the air flowing in your case and over the graphics cards.

Is all this trouble worth it? As we've said before, the power of four GPUs really requires an ultra-high-resolution panel. If you're running a 20-incher or even a 24-inch display, plain SLI should be sufficient. nVidia even says standard SLI is fine for a 30-inch panel when you're not running AA. But does quad pay off when you're running graphics at full-throttle?



The original GeForce 7900 GX2 cards were plagued by bad drivers and mobo-incompatibility problems.

To judge performance, I gave quad SLI a run with a 7950 GX2 from BFG and XFX each. I ran the cards with a Dell 30-inch panel connected to our standard zero-point FX-60 rig, with both the original 91.33 beta drivers and the GX2-only 91.45 beta drivers.

While previously there was some justification for quad SLI, today the config appears to be a dud, even at high resolutions with AA enabled.

The quad-SLI configuration could not compete with a set of stock-clocked 7900 GTX cards with either the 91.33 drivers or the 91.45 drivers, at either standard resolutions or high resolutions with AA enabled. What's the issue? I'm not sure, but there are reports that nVidia is working on a new "performance" driver for the cards. Let's hope so, because today, the 7950 GX2 GPUs in quad can't even match the performance we experienced months ago with the 7900 GX2 cards. Right now, there's just no point in quad SLI.

BENCHMARKS

SLI VS. QUAD SLI IN 3DMARK05	1280X1024	2560X1600	2560X1600 8X AA/16X ANISO
GEFORCE 7950 GX2 91.45 W/ QUAD SLI ENABLED	12,059	7,691	6,802
GEFORCE 7950 GX2 91.33 W/ QUAD SLI ENABLED	12,161	7,701	6,455
GEFORCE 7900 GTX 91.33 W/ SLI ENABLED	13,391	9,648	7,684

The benchmark was run on our standard Athlon FX-60 test bed at the listed resolutions and settings.

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How We Test

Real-world benchmarks. Real-world results

Computer performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC,* our mantra for testing has always been "real world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six benchmarks we use to test every system we review.

SYSmark2004 SE: This is an update of the *SYSmark2004* benchmark, which uses a suite of such common applications as Microsoft *Word, Excel, PowerPoint*, Macromedia *Dreamweaver*, *Flash,* and *Winzip* to test general performance. It isn't heavy in multithreading, but it does feature multitasking tests.

Adobe Premiere Pro 2.0: We finally ditched our old standard-def *Premiere* test for one that uses high-def source material. The test is multithreaded, uses the GPU for transitions, and is brutal. It takes about an hour on our zero-point to render a short two minute, 46 second benchmark movie in the program.

Adobe Photoshop CS2: We start with a RAW photo shot with a Canon EOS 20D, and apply a crapload of filters and other tasks from *CS2* to see just how fast a rig can chew through the workload. Because we use every filter we can, the test is more fair and balanced than the usual cherry picking of *Photoshop* tests.

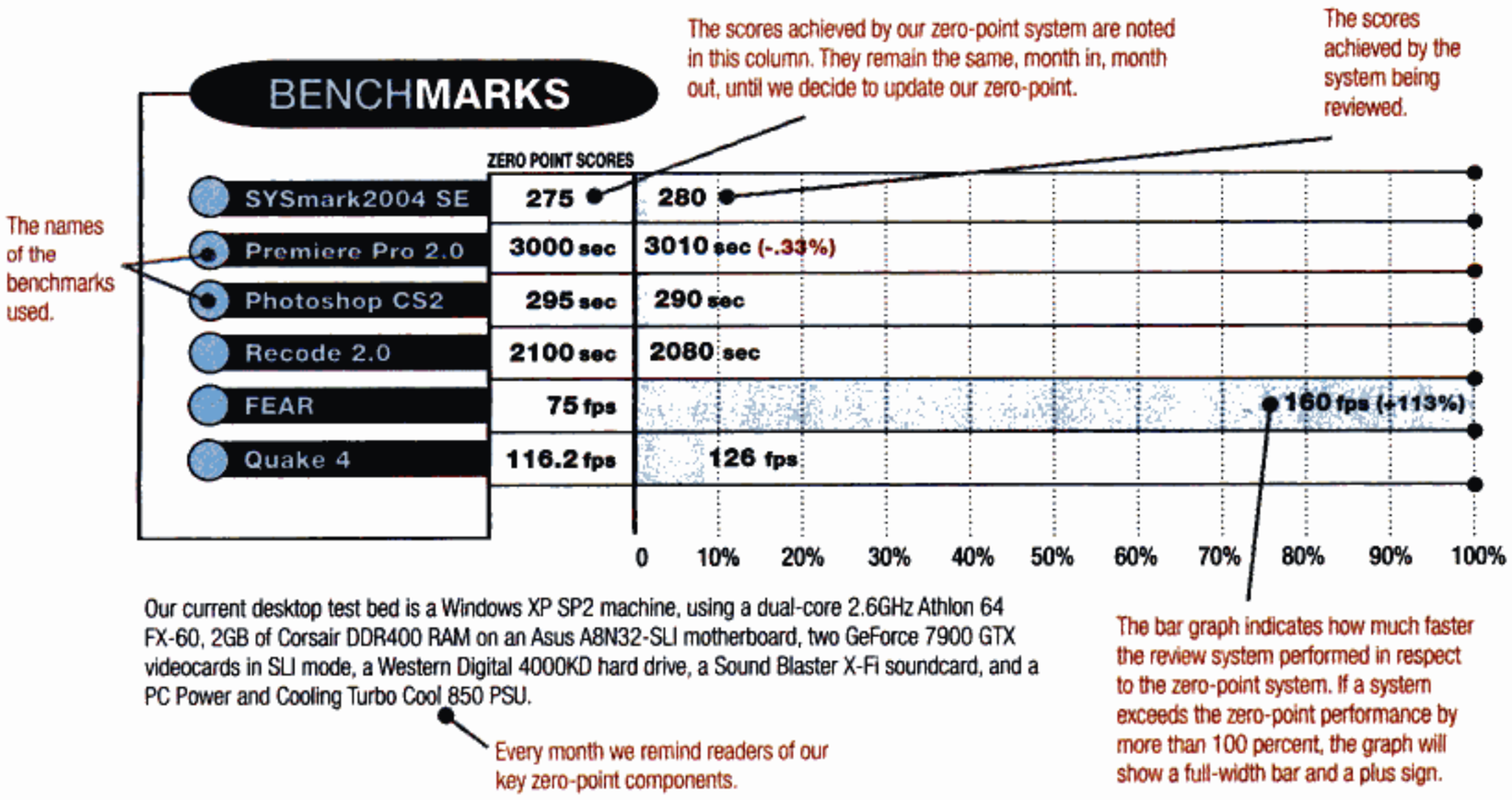
Ahead Nero Recode 2.0: *Nero Recode 2.0* is one of the fastest video-transcoding utilities. We copy unencrypted VOB files to the hard drive, then convert the movie to the Sony PSP's MPEG-4-based format. The program is heavily multithreaded, and shows marked performance increases on dual-core machines.

Quake 4: Based on the *Doom 3* engine, *Quake 4* is a popular OpenGL game. We run our test at 1600x1200 with 4x antialiasing and 4x anisotropic filtering. Generally, more robust OpenGL drivers yield better performance. We use a custom timedemo recorded using the 1.2 patch, which supports Hyper-Threading and dual-core processors.

FEAR: Monolith's *FEAR* is a cutting-edge DirectX game that pushes graphics hardware and systems to the limit. We run *FEAR* at 1600x1200 with soft shadows, physics, and audio acceleration enabled, and using the 1.03 patch.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



Our current desktop test bed is a Windows XP SP2 machine, using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N32-SLI motherboard, two GeForce 7900 GTX videocards in SLI mode, a Western Digital 4000KD hard drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Turbo Cool 850 PSU.

Every month we remind readers of our key zero-point components.

The bar graph indicates how much faster the review system performed in respect to the zero-point system. If a system exceeds the zero-point performance by more than 100 percent, the graph will show a full-width bar and a plus sign.

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocards, dual-card config
XFX GeForce 7900 GTX (model PV-T71F-YDD9)

High-end videocard, single-card config
eVGA e-GeForce 7950 GX2

Midrange videocard:
Sapphire Radeon X1900GT

Soundcard:
Creative Labs X-Fi Xtreme Music

Hard drive:
Seagate Barracuda 750GB 7200.10

External backup drive:
Western Digital Dual-Option Media Center 320GB

Portable USB drive:
Maxtor One Touch III 100GB

DVD burner:
Plextor PX-716A

Widescreen LCD monitor:
Dell 2407FPW

Desktop LCD monitor:
NEC 90GX2

Socket AM2 Athlon 64 mobo:
Gigabyte GA-M59SLI-S5
This mobo gives you a backup BIOS and a third open x16 slot

Socket 775 Core 2 Duo mobo:
Asus P5W DH Deluxe

Portable MP3 player:
Apple iPod

5.1 speakers:
M-Audio Studiophile LX4 5.1 (LX4 2.1 with 5.1 Expander System)

2.1 speakers:
M-Audio Studiophile LX4 2.1

Mid-tower case:
ThermalTake Armor Jr.

Full-tower case:
Silverstone TJ07

Games we are playing:
Battlefield 2142, Poker Academy Pro, The Ship, CivCity: Rome, Battlefield 2, Hitman: Blood Money

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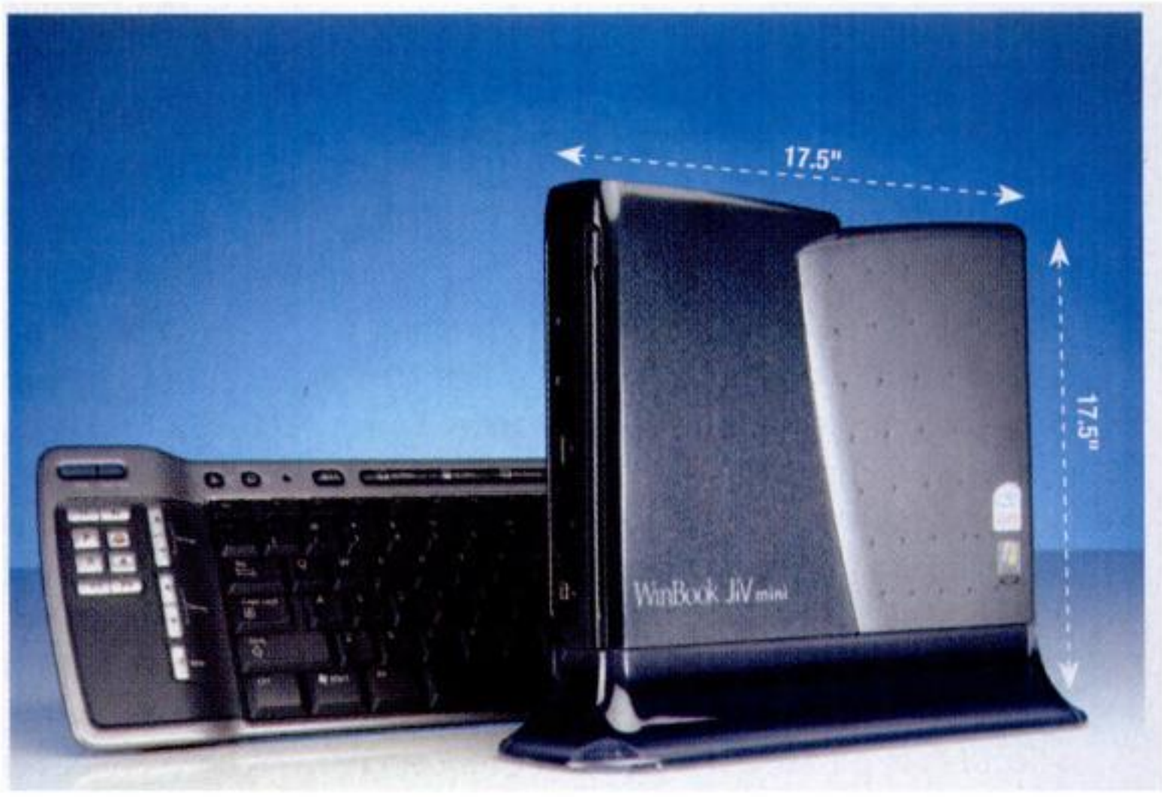
WinBook Jiv Mini

We'll avoid the obvious 'Jiv turkey' joke



WinBook's Jiv could be the quietest HTPC we've ever tested.

When we first received WinBook's Viiv-ready Jiv (both words rhyme with *five*—go figure), we realized that we didn't really know exactly what it meant to be a "Viiv" PC. And remember, we pride ourselves on knowing the difference between an AMB and AMT.

Is Viiv a marketing code-name for paired technologies, like Centrino's triumvirate of Pentium M, Intel 855 chipset, and Intel wireless chip? Or is it some content service you sign up for? Perhaps it's special software that's bundled with Microsoft Media Center Edition 2005?

We've since come to the conclusion that Viiv is any and all of these things. Combine any Intel dual-core CPU with certain Intel chipsets (why you couldn't be Viiv-ready with ATI or nVidia chipsets, we don't know) and certain Intel network chips, and you've got a Viiv machine. Also toss in a standby mode that actually works, some media content of dubious value, and HD Audio drivers, and you're ready to, uh, Viiv. Even though Viiv is supposed to be for living room PCs, you don't actually need a TV tuner or even adequate 3D graphics to get a Viiv badge. That's right, Viiv is a total quagmire.

Fortunately, despite its Viiv sticker, WinBook's Jiv is an entirely refreshing tack on the Windows Media Center PC theme. While most MCE machines we've seen are little more than desktop cases with a crapload of loud and hot hardware stuffed inside, the Jiv goes in the other direction.

About the size of an external USB hard drive, the Jiv features a mobile Intel 1.66GHz Core Duo T2300 processor coupled with an Intel 945G chipset and wireless chip and a TV tuner. With its notebook heritage, the power-sipping system trades the fan-cooled PSU found in other MCE boxes for a simple power brick.

A slot-fed double-layer DVD burner, a 100GB Seagate Momentus 5400.2 hard drive, and a Microsoft MCE keyboard make up the rest of the package. This all adds up to one hell of a quiet PC. Its diminutive size lets you put it in an unobtrusive spot in your media cabinet or tuck it aside your TV.

The Core Duo T2300 is quite capable of handling most media center chores, but the Intel 945G graphics is a pathetic weak sister to the puniest discrete part—the Jiv generated an astounding 3fps in *Doom 3* and a whopping 416 in *3DMark2005*.

These benchmarks, mind you, aren't our standard desktop benchmarks. We used our standard notebook tests for this review because the Jiv is more notebook than desktop.

Aside from gaming, the Jiv performs OK. It's actually faster than our zero-point notebook—a 2.13GHz single-core Pentium M rig—in the multithreaded Adobe *Premiere Pro* test, but the Jiv loses by about 10 percent in Adobe *Photoshop CS*. That's likely due to the app's single-threaded nature and the 200MHz difference between the machines. The 100GB Seagate Momentus 5400.2 is quiet and fairly spry for a notebook drive, but it's sorely lacking in storage space—the Jiv's biggest weakness.

Because the unit has a tuner, we'd imagine that recording TV in MCE would be a primary function. With only 80GB free, you'll have to make some tough choices when TNT runs its *Law and Order* marathons. You can, of course, connect a second drive using USB, but that destroys the benefit of the Jiv's tiny, space-conscious profile. Seagate's 160GB or Fujitsu's 200GB drive would greatly up the recording space while keeping the unit slim, but we'd really rather see a slightly larger box with a 500GB or 750GB desktop drive.

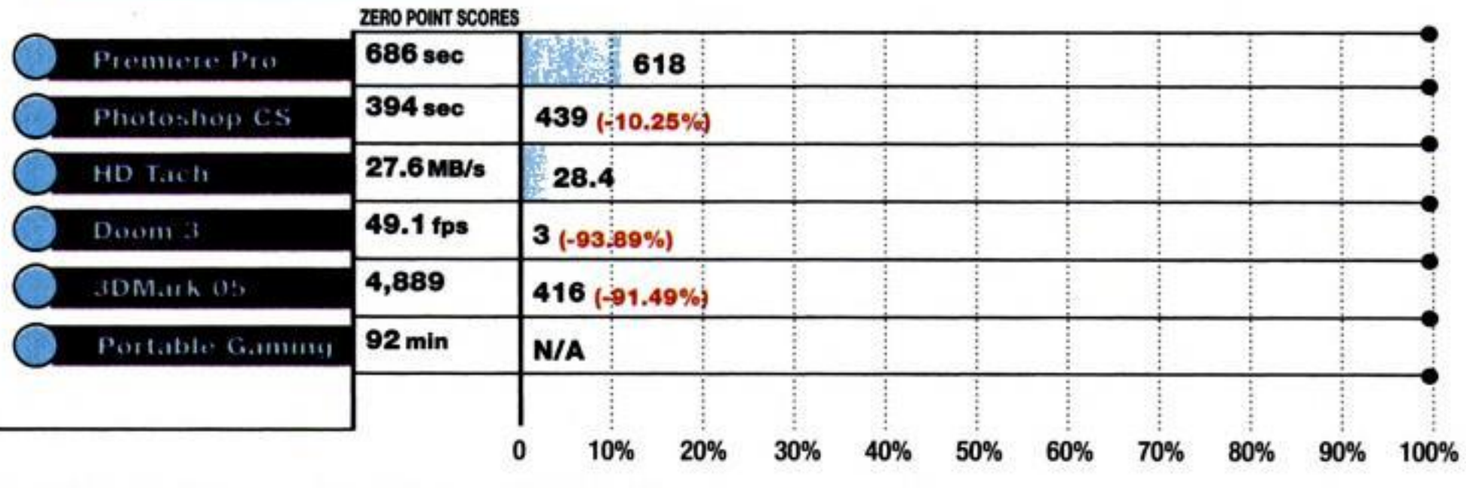
That leaves the Jiv in a tough spot. We like the concept and compact size of this machine but the poor graphics and small hard drive make it a tough pill to swallow.

—GORDON MAH UNG

SPECS

CPU	Intel 1.66GHz Core Duo T2300
RAM	1GB DDR2/667
GRAPHICS	Intel integrated 945G
HARD DRIVE	Seagate 100GB Momentus 5400.2
OPTICAL	Matshita UJ-845S

BENCHMARKS



Our zero point is a Dell Inspiron XPS, with a 2.13GHz Pentium M, 1GB of DDR2/533 RAM, and a GeForce Go 6800 Ultra.

WINBOOK JIV

FOXY BROWN

Almost silent and unobtrusive, the Jiv should fit anywhere.

ORIGINAL GANGSTAS

Low-capacity hard drive and pathetic graphics power make this a TV-only device.

6

$1,200 ($1,100 w/o keyboard), www.winbook.com

Copyrighted material

Where does WinBook jam the TV tuner in this baby? We're not sure, but it's undoubtedly a tight squeeze.

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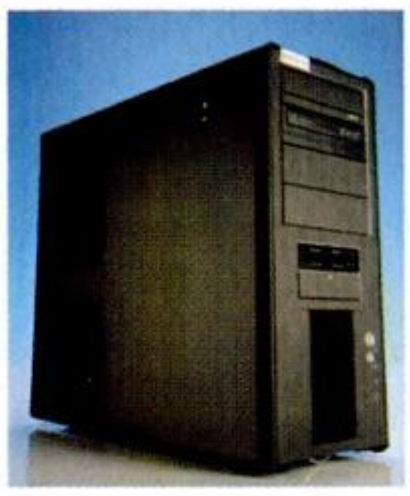
iBuyPower Gamer's Fire

Funky-fast and just plain funky too

You can look at every PC as having its own personality—an essence comprising its strengths, quirks, and flaws. Take iBuyPower's Gamer's Fire PC, for example: It's a crossbreed of Rodney Dangerfield and Steven Seagal. You might not respect its pot belly and ugly golf clothes, but it can snap a suite of benchmarks like a twig.



The Intel Core 2 Extreme CPU in iBuyPower Gamer's Fire is mismatched with AMD's CrossFire cards.

Of course, we expected nothing less of a machine equipped with Intel's Core 2 Extreme X6800 CPU. iBuyPower paired the X6800 with a respectable MSI 975X Platinum mobo.

Two 10K Raptors in RAID 0 handle storage (along with a Samsung double-layer burner and a DVD-ROM drive). And this is where the Gamer's Fire is decidedly Dangerfield. Like Falcon Northwest's screaming-fast Mach V box from last month, iBuyPower gives you no backup for your 300GB RAID. Sure, you can easily add an external USB drive, but iBuyPower should have anticipated that need and included another 500GB drive inside. And iBuyPower made the controversial decision to skip the SoundBlaster X-Fi card for onboard HD Audio. This isn't a trend we like. Perhaps iBuyPower omitted the soundcard because the inside was getting too cramped.

The space crunch is only compounded by a typically poor iBuyPower wiring job. If Voodoo is known for its stellar wiring, iBuyPower is building a reputation for its signature "zip tie all the loose wires together" look.

The NZXT case is sturdy, but a tight fit for the hardware and water cooler.

Just when you're ready to write off the Gamer's Fire completely, its Seagal side comes out with an elbow to your nose. In applications, the Gamer's Fire is fast. Not quite as fast as Falcon's expensive overclocked machine, but enough to put a hurt on all of the previous Athlon 64 machines we've seen this year and even on the Dream Machine.

The Gamer's Fire really shines when compared with our Athlon 64 FX-60 zero-point system. The Core 2 Extreme stomps our FX-60 in the application-intensive *SYSmark2004 SE* with a score about 55 percent faster. The Gamer's Edge completes our Adobe *Photoshop CS2* test about 75 percent faster than the zero-point and is about 73 percent faster in our Adobe *Premiere Pro 2.0* HDV test—faster even than our Dream Machine 11. When you consider that our overclocked Dream Machine had a 300MHz advantage, you have to wonder what's up. But then we got to the games. That's where the Gamer's Edge up and struts its ugly checkered golf jacket and white shoes.

In *FEAR*, the Gamer's Edge is actually slower than our zero-point—which sports a pair of GeForce 7900 GTX cards in SLI—by 13 percent. In *Quake 4,* the Gamer's Edge barely beats our zero-point by a measly 2 percent. To keep things in perspective, the Gamer's Edge is capable of playing any game out today at high resolutions without frame rates being an issue. But our Dream Machine 11 and Falcon's Mach V ran about 20 percent faster in *Quake 4* and roughly 30 percent faster in *FEAR*. That's a grim reminder of why we don't see many CrossFire systems and why we chose nForce over the 975X chipset.

In fact, we wonder if the Gamer's Fire is really the right name. With its ass-kicking application performance, iBuyPower might want to consider calling this baby the Applications' Fire or Content Creation's Fire instead.

—GORDON MAH UNG

UNDER THE HOOD

BRAINS	
CPU	Intel Core 2 Extreme X6800 (2.93GHz dual core)
MOBO	MSI 975X Platinum (Intel 975X)
RAM	2GB Corsair (two 1GB sticks)
LAN	Intel Pro/1000 Ethernet
HARD DRIVES	Two 150GB Raptors (10,000rpm SATA) in RAID 0
OPTICAL	HL-DT GDR8164B, TSSTCorp SH-S162L
BEAUTY	
VIDEOCARD	Two ATI Radeon X1900XT in CrossFire (621MHz / 720MHz)
SOUNDCARD	Onboard HD Audio
CASE	NZXT Adamas
BOOT: 49 sec.	DOWN: 10 sec.

IBUYPOWER GAMER'S FIRE

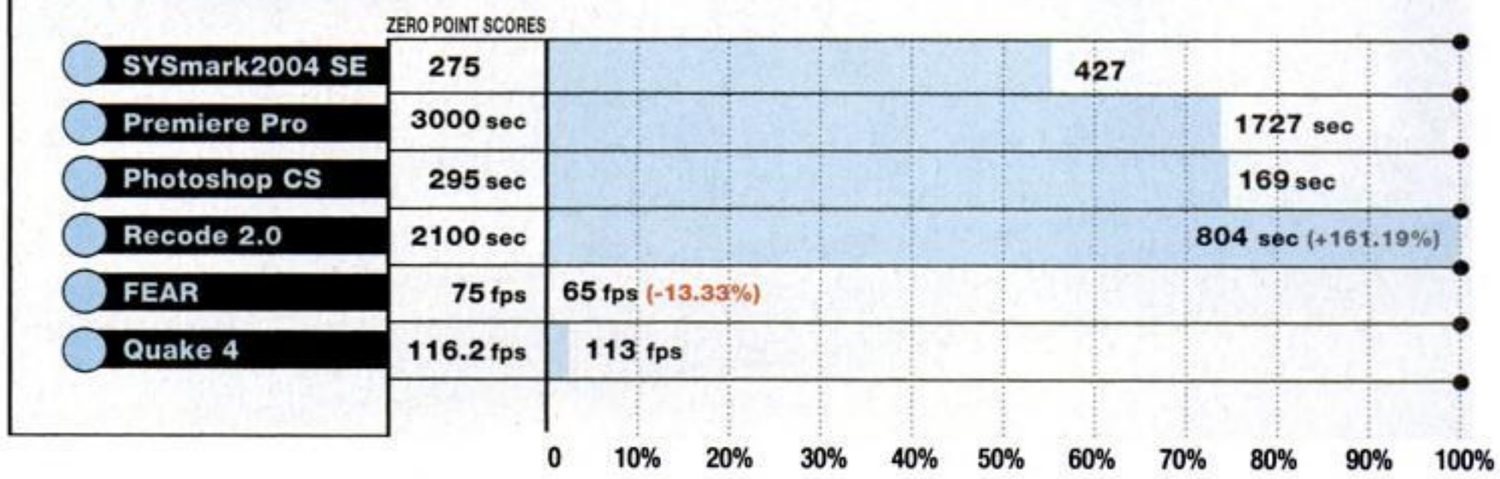
BACK TO SCHOOL
Core 2 Extreme rips through applications tests.

ROVER DANGERFIELD
CrossFire can't hold a candle to a pair of 7900 GTX cards.

7

$4,700, www.ibuypower.com

BENCHMARKS



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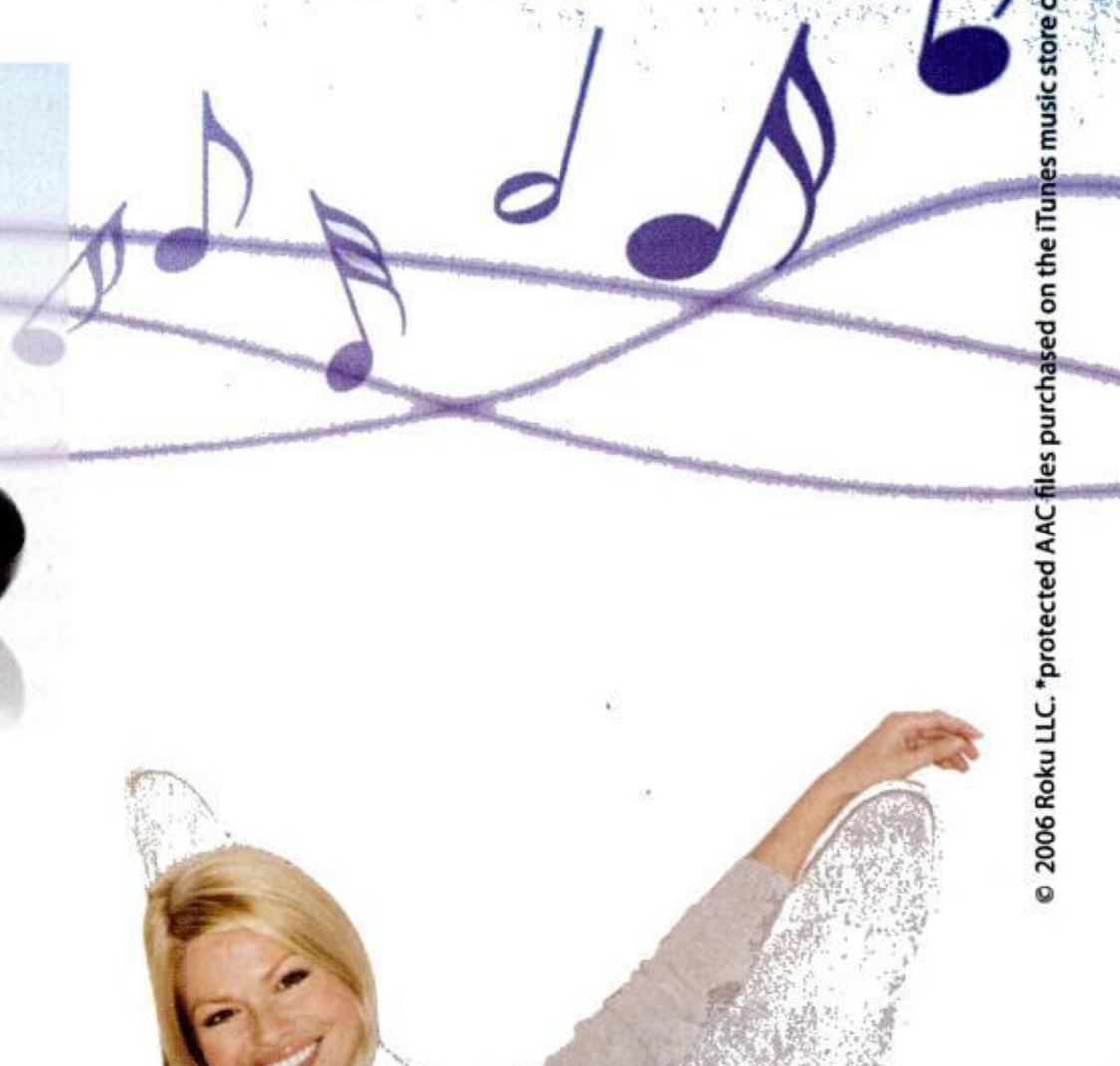
The sound you require.



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SoundBridge is a network music player that plays your Mac or PC music library and Internet radio in any room of the house, connecting your stereo or powered speakers to the music you love via Wi-Fi or Ethernet.

SoundBridge Radio is a simple, high-performance compact system that's ready for the digital world. You get unsurpassed stereo sound, Wi-Fi music streaming, Internet radio, AM/FM radio, dual alarms with volume ramp, auto-dimming vacuum fluorescent display, and 18 presets that make it a snap to access your favorite stations, playlists or any music search you desire.

Wireless Internet radio and music streaming from Roku

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Exotic X1900 XTXs

Proof that there's more to life than reference designs

Although ATI's X1950 XTX has displaced the X1900 XTX as the company's top-of-the-line GPU, these two unusual board designs remain worthy of examination. HIS and Sapphire Technology both improve on the single biggest shortcoming of ATI's original reference design: its noisy cooler.

—MICHAEL BROWN

Sapphire delivers all the benefits of liquid cooling without exposing users to any of its risks.

HIS RADEON X1900 XTX ICEQ3

HIS uses plain-ol' air to chill the X1900 XTX and the 512MB of DDR3 memory on the IceQ3, but the IceQ3's cooler diverges widely from ATI's whiney leaf-blower. HIS places one large copper heatsink and a sintered heatpipe over the GPU (the heatpipe is welded to the heatsink using a technique that doesn't melt the adjoining materials). A second, physically distinct copper heatsink spans the eight memory chips to prevent any thermal transfer between them and the GPU.

A 7.25cm fan draws air in from both sides of its hub, blows it across the heatsinks, and out of the case. Locating such a large fan so far back on the card offers two advantages: The air it's circulating hasn't already been warmed by the GPU, and the small amount of noise it produces remains trapped inside the case.

The cooler on HIS' X1900 XTX IceQ3 is much quieter than ATI's reference design, but the card itself isn't any faster.

The IceQ3 came from the factory with its GPU and memory clocked at ATI's reference-design values of 650- and 775MHz, respectively. After unlocking the board using the Overdrive tool in ATI's Catalyst driver, we were able to boost the core to 689MHz and the memory to 774MHz. This didn't deliver much of a performance boost over ATI's reference design (which auto-overclocked to 689- and 792MHz, respectively), but the core in HIS' card ran cooler by 7 C at peak load.

HIS RADEON X1900 XTX ICEQ3

BLUE ICE

Considerably cooler and quieter than reference design.

YELLOW SNOW

Expensive; no faster than reference design.

6

$530, www.hisdigital.com

SAPPHIRE TECHNOLOGY TOXIC X1900 XTX

The common perceptions of liquid cooling are that it's quiet and that it increases the headroom available for overclocking. The common fear of liquid cooling is that the slightest mistake—failing to tighten a hose clamp, for instance, or incorrectly torquing a water block—can lead to disaster.

Sapphire's Toxic X1900 XTX delivers the perceived benefits of liquid cooling while greatly diminishing risk to the do-it-yourselfer: Sapphire preinstalled what looks like a custom version of ThermalTake's Tide Water cooler. And then went two steps further by factory-overclocking the GPU to 675MHz and the memory to 800MHz (from ATI's reference-design speeds of 650- and 775MHz, respectively).

After unlocking the card and running ATI's Overdrive utility, we were further impressed to see the X1900 XTX's clock speed jump to 689MHz (memory inched up just 1MHz). GPU temps, meanwhile, topped out at 78 C with the two-speed fan running on high, and 81 C with it on low. (Because the fan is a trifle noisy at high speed, we recommend using low speed if your environment permits.)

Although the cooling apparatus doesn't draw power from the PCI bus, the reservoir is designed to reside in one of those slots. This didn't prevent us from running an X-Fi soundcard—and we were able to fit an X1900 XT CrossFire Edition in there, too—but it left no room in our Asus A8R32-MVP Deluxe motherboard for any other expansion cards.

SAPPHIRE TOXIC X1900 XTX

WHITE WATER

Cool and quiet; impressive clock speeds.

EFFLUENT

Expensive; slower than 7950 GX2 cards.

7

$550, www.sapphiretech.com

BENCHMARKS

	REF-DESIGN X1900 XTX	CROSSFIRE MODE	HIS X1900 XTX ICEQ3	CROSSFIRE MODE	SAPPHIRE X1900 XTX TOXIC	CROSSFIRE MODE
3DMARK06 HDR/SM3 #1 (FPS)	18.5	32.2	17.8	32.1	18.6	33.0
3DMARK06 HDR/SM3 #2 (FPS)	19.8	34.9	19.1	34.9	20.0	35.7
QUAKE 4 (FPS)	60.5	99.2	59.8	99.3	60.8	101.3
OBLIVION (FPS)	23.3	22.7	23.7	23.7	23.6	23.8
FEAR (FPS)	36.0	54.0	35.0	55.0	36.0	55.0
MAX TEMP (C)	89	N/A	82	N/A	78 / 81	N/A

*Videocard benchmarks obtained with an Asus A8R32-MVP Deluxe motherboard, using the native resolution of a 23-inch ViewSonic VP2330wb display (1920x1200). **3DMark06 HDR Games:** Tested with antialiasing turned off and anisotropic filtering set to 8x. **Quake 4:** Tested with 4x AA and 8x aniso. **Oblivion:** Tested with AA off, HDR lighting on, and all other values set to maximum. **FEAR:** AA off, 8x aniso, soft shadows on. Temperatures measured using Catalyst Overdrive 6.7.*

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ADVANCED WARFIGHTER

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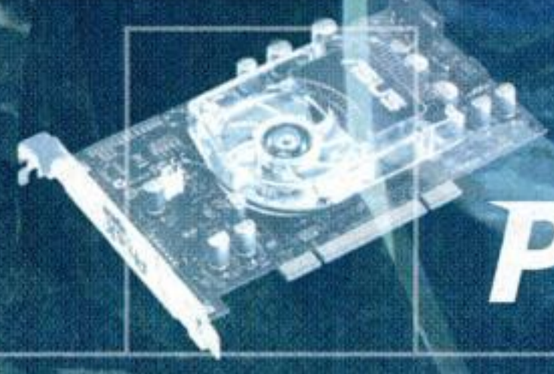

PhysX P1

Reality gaming is a matter of PhysX. Calculating how energy and matter interact at the particle level more than 500,000 times per second, the ASUS PhysX card provides you with a gaming environment that doesn't just look real – it acts real. Explosions, collisions, fire, smoke, and movement are all suddenly believable. Making the gaming experience suddenly – unbelievable_

ASUS®

usa.asus.com/maxpc/physx

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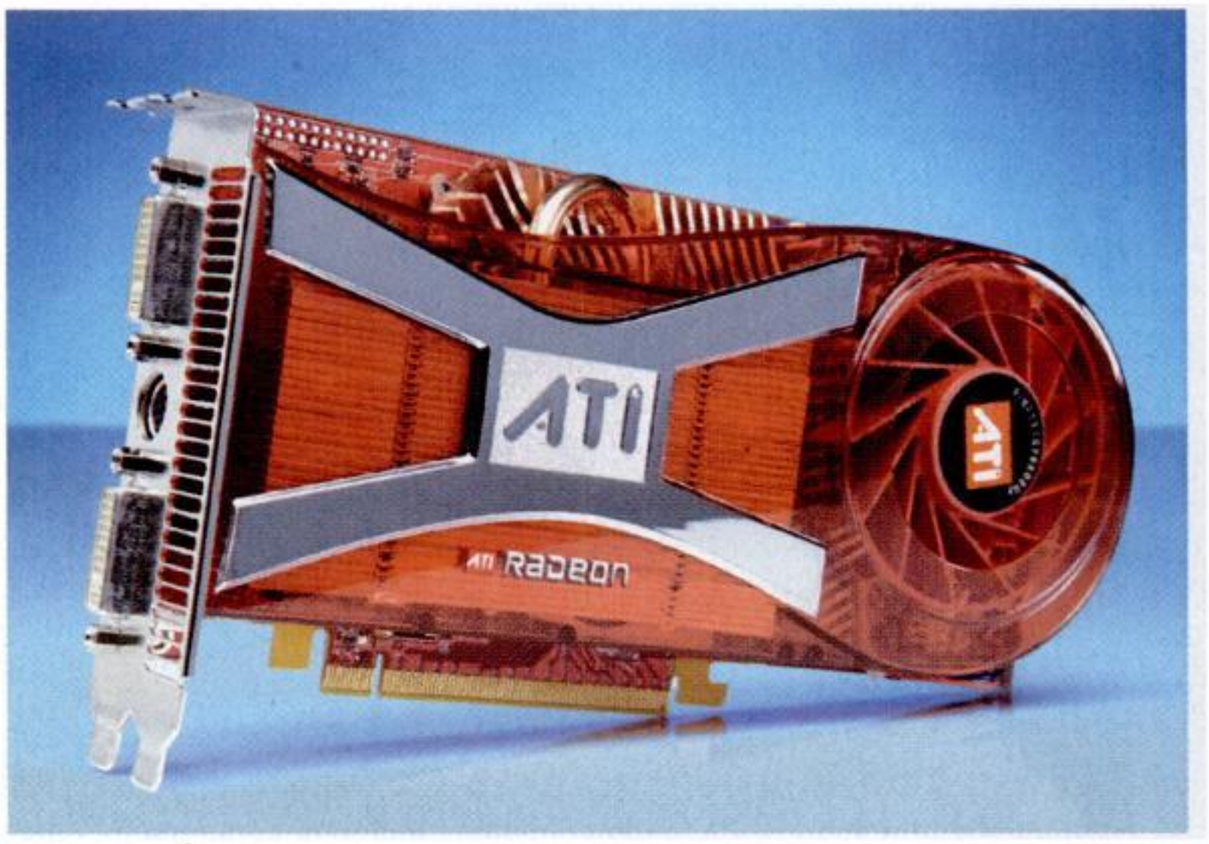
ATI X1950 XTX

Meet the new king of the single-GPU hill



ATI's new X1950 XTX is certainly fast, and it's unique in offering 1GHz, GDDR4 memory, but we just can't make a "buy" recommendation on a high-end videocard that's soon to be rendered obsolete by DirectX 10.

The PC market is an unforgiving, what-have-you-done-for-me-lately place, as ATI is well aware: The company's been playing second fiddle to nVidia for almost two years now. Still, ATI has introduced its share of innovations—Avivo, 512MB frame buffers, and 48 pixel shaders among them—and now it *finally* has the fastest single-GPU videocard.

It's important to note, however, the distinction between a single-GPU videocard and a single videocard. nVidia's dual-GPU GeForce 7950 GX2 remains the performance leader in the latter category; but the X1950 XTX is no slouch. This is the first consumer videocard to feature 512MB of GDDR4 RAM, clocked at a blistering 1GHz. Good thing, too, because the GPU, which ATI has dubbed the R580+, is not radically different from the X1900 XTX: It has the same number of pixel shaders (48), the same number of vertex shaders (8), and the same core clock speed (650MHz).

The fan on ATI's X1900 XTX is loud enough to wake the dead, so ATI wisely adopted a new cooling design—one that's very similar to HIS' IceQ Radeons—for the X1950 XTX: a ginormous copper heatsink covering the GPU and memory, and a very large fan (7.25cm) mounted far back on the card. The X1950 XTX GPU still runs considerably warmer than nVidia's GeForce 7900 GTX—by about 15 C under load—but thanks to this new cooling design, the card produces very little fan noise: It's easily as quiet as nVidia's 7900 GTX.

ATI has also introduced an X1950 CrossFire Edition, which unlike the X1900 CrossFire, has an identical core clock speed (the previous top-end master card runs 25MHz slower than its mate). Unfortunately, anyone interested in building a dual-Radeon rig remains saddled with ATI's unappealing external cable connection. And as with nVidia's SLI, running in CrossFire mode shuts down the second display in dual-head configuration. ATI hasn't figured out how to play video using CrossFire, either; you must disable it for DVD playback. On the bright side, the card supports HDCP copy protection through its DVI ports, which makes it an eligible partner for next-gen optical drives.

When we unlocked and overclocked the X1950 XTX using the utility built into ATI's Catalyst Control Center, the software goosed the GPU's core clock speed to 668MHz, but it didn't increase the speed of the memory at all. In any event, the speed bump didn't have much impact on performance: The performance increased just 3 percent, at most. In single-card mode, the X1950 XTX is significantly faster than a reference-design 7900 GTX in some of our benchmarks, moderately faster in others, and slower—by one frame per second—in one (refer to the benchmark chart for details).

ATI is proud of the fact that its X1000 cards can perform high dynamic-range lighting and antialiasing at the same time—nVidia's cards can't. But the value of such a feature is diminished by the performance hit the card takes to deliver it. Turning on 4x AA in our *3DMark06* HDR tests resulted in a 19 percent reduction in frame rate in Game 1, and a 38 percent drop in Game 2.

So, the X1950 XTX is the fastest single-GPU card out there. Should you drop four and a half bills on one? Frankly, it's tough for us to recommend dropping that kind of green on *any* DirectX 9 videocard right now, simply because DirectX 10 is waiting in the wings. Think of it this way: If you buy this card today, and DX10 comes out as late as April 2007, will it have delivered $100 per month of value by then?

—MICHAEL BROWN

SPECS

GPU	ATI X1950 XTX
MEMORY	512MB GDDR4
CORE CLOCK SPEED	650MHz
MEMORY CLOCK SPEED	1GHz

BENCHMARKS

	ATI X1950 XTX	NVIDIA 7900 GTX	X1950 XTX IN CROSSFIRE	7900 GTX IN SLI
3DMARK06 GAME 1	**18.8**	13.7	**34.8**	25.3
3DMARK06 GAME 2	**20.4**	19.2	**38.4**	37.8
QUAKE 4	**67.8**	61.5	99.3	**110.4**
OBLIVION	**23.3**	18.2	**24.1**	19.4
FEAR	35.0	**39.0**	58.0	**68.0**
HQV	63	**88**	0	**88**

Scores other than HQV stated in frames per second. Best scores in single- and dual-card modes are bolded. Videocard benchmarks run at the native resolution of a ViewSonic VP2330wb display: 1920x1200. ***3DMark06*** *HDR tests: Antialiasing turned off and anisotropic filtering set to 8x.* ***Quake 4:*** *AA set to 4x and aniso set to 8x.* ***Oblivion:*** *AA turned off, high dynamic-range lighting turned on, and all other values set to maximum.* ***FEAR:*** *AA turned off and soft shadows enabled. ATI cards tested in an Asus A8R32-MVP Deluxe motherboard; nVidia cards tested in an Asus A8N32-SLI Deluxe. AMD's dual-core 2.6GHz FX-60 CPU installed in each, along with 2GB of DDR400 memory.*

ATI RADEON X1950 XTX

HOT BOX

Faster than nVidia's best single-GPU cards; HDCP compatible.

CAT BOX

Not the fastest single videocard; late in the game for a high-end DX9 card.

9

$450, www.ati.com

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Shootout at the AM2 Coral

AMD makes its final stand with these new mobos

You wear a 3DNow! hat to LAN parties, your Skype handle is "Intelsuxors," and if mom would let you, you'd have an AMD logo tattooed across your scrawny nerd chest. And, dog gone it, as sure as the sun will rise, you're sticking with Athlon 64 until it has to be pried from your cold, mouse-palsied hands—even if Core 2 continues to kick ass for the next three years. Well, homeslice, this roundup is for you. To the keeper of the flame, the AMD faithful, we present three hot-new AM2 mobos to keep you warm on those cold, cold, winter nights.

—GORDON MAH UNG

MSI K9N SLI PLATINUM

We loved MSI's last nForce4 board so much that we gave it a Kick Ass award and even bumped the Asus A8N32-SLI board from our Best Of The Best list. Unfortunately, MSI was so late to the nForce4 SLI x16 party that the board debuted right on the cusp of the AM2 launch; thus its lifespan was brief, and product was impossible to find. Well, MSI promises that the new K9N SLI Platinum is free of unobtainium—too bad the K9N SLI Platinum isn't quite as sexy as the last MSI board we reviewed.

The board steps down from dual x16 PCI-E slots to dual x8 slots. Also left on the factory floor are nVidia's automatic PCI-E overclocking feature and EPP memory support for easier clock boosts. It's not all bad, though. For the most part, it's difficult to find a performance difference between two GPUs operating in x16 or x8 mode. And overclocking the PCI-E bus hasn't proven to give much of a boost, either. Dropping to dual-x8 SLI support also lets MSI use a single-chip chipset (with more modest cooling requirements) instead of the two chips that a full nForce 590 requires. MSI also omitted the POST LED, an extra SATA controller, and eSATA support.

The sweet thing about the K9N SLI Platinum is that it delivers some of the more useful 590 features to budget users, without the extra cost. The 570 gives you paired Gigabit Ethernet and packet prioritization for $160. While we can understand eliminating certain options for a poor-boy config, we're baffled as to why MSI left out the LEDs—that's what lets you know the board is powered.

The K9N SLI Platinum did quite well in our performance testing, especially for a board this cheap—it managed to hang with the pricier nForce 590 Gigabyte board. That makes it a good choice for AM2 SLI on a shoestring budget.

MSI K9N SLI PLATINUM

+ SNICKERS

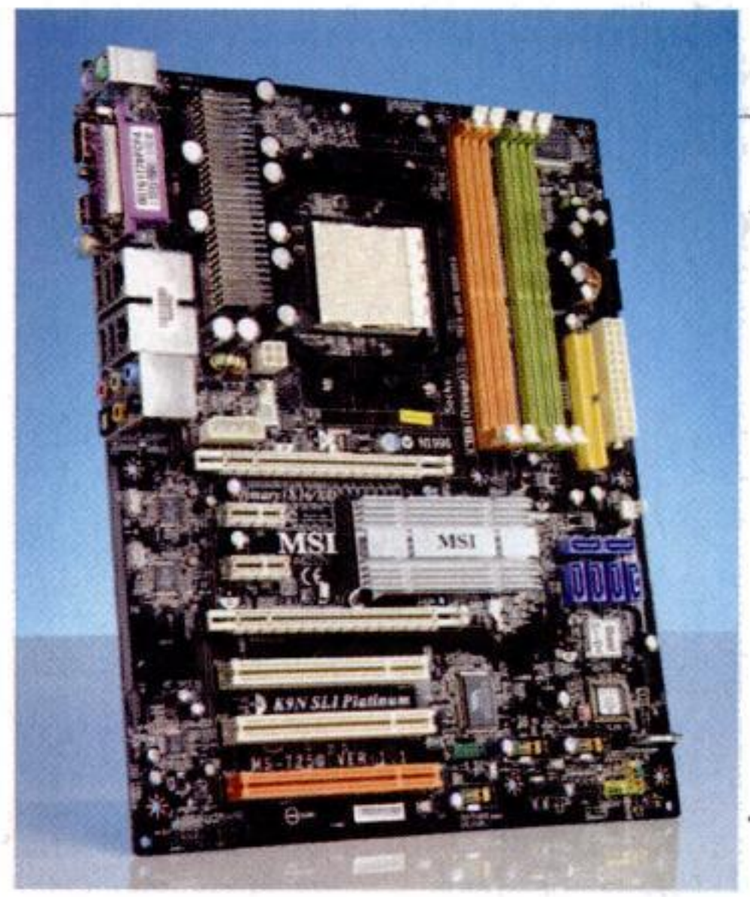
Good performance and a low price make this the entry-level SLI board to own.

– 3 MUSKETEERS

Omits advanced features such as power LED and eSATA, to save a buck.

8

$160, www.msicomputer.com



MSI's K9N gets you into nForce 500 land without the stiff price.

ECS KA3 MVP EXTREME

ATI's often-overlooked chipsets for the Athlon 64 CPUs got a serious lift this summer when AMD bought the Canadian graphics company. While we can't guarantee that nVidia will continue to support AMD in two years, we can predict that ATI is likely to support its new master. That's a good thing for ECS' KA3 MVP Extreme board.

The board uses ATI's existing CrossFire Xpress 3200 north bridge, with a new SB600 south bridge. The board is priced as a budget mobo but boasts several non-budget features. The Xpress 3200 chipset includes dual x16 PCI Express slots, and does it using a single chip instead of the two that nVidia requires. It's amazing how tiny and cool the CrossFire Xpress 3200 chip is. The board also includes an "anti-burn" LED to let you know when it's safe to pull the RAM, as well as LEDs to let you know when the PCI cards are firmly in place. ECS even bundles a spare BIOS chip that you can clip to the existing BIOS, if you fry it. The biggest cut is in the LAN department: This board sports just one

BENCHMARKS

MAKE MODEL CHIPSET	ASUS M2N32-SLI DELUXE NFORCE 590 SLI	MSI K9N SLI PLATINUM NFORCE 570 SLI	ECS KA3 MVP CROSSFIRE XPRESS 3200	GIGABYTE GA-M59SLI-S5 NFORCE 590 SLI
QUAKE III (FPS)	**584**	547	533	581
SISOFT SANDRA 2007 RAM (MB/S)	8,845	**8,905**	8556	7300
3DMARK 2001 SE	35,953	**36,750**	35,041	36,180
3DMARK05	11,118	11,053	11,018	**11,168**
3DMARK06	6,124	6,170	6,166	**6,178**
PC MARK 2005 OVERALL	6,800	**6,909**	6,770	6,823
PC MARK 2005 MEM	5,286	5,315	5,189	**5,495**
PC MARK 2005 HDD	6,057	**6,129**	5,714	6,044
ADOBE PREMIERE PRO HDV TEST (SEC)	2,680	2,661	2,693	**2,660**

Best scores are bolded. We used an AMD 2.8GHz Athlon 64 FX-62, 2GB of Corsair DDR2/800 EPP-enabled RAM manually set at 4-4-4-12, a 400GB Western Digital WD4000KD SATA hard drive, an nVidia GeForce 7900 GTX, a PC Power and Cooling 1KW PSU, and Windows XP SP2.

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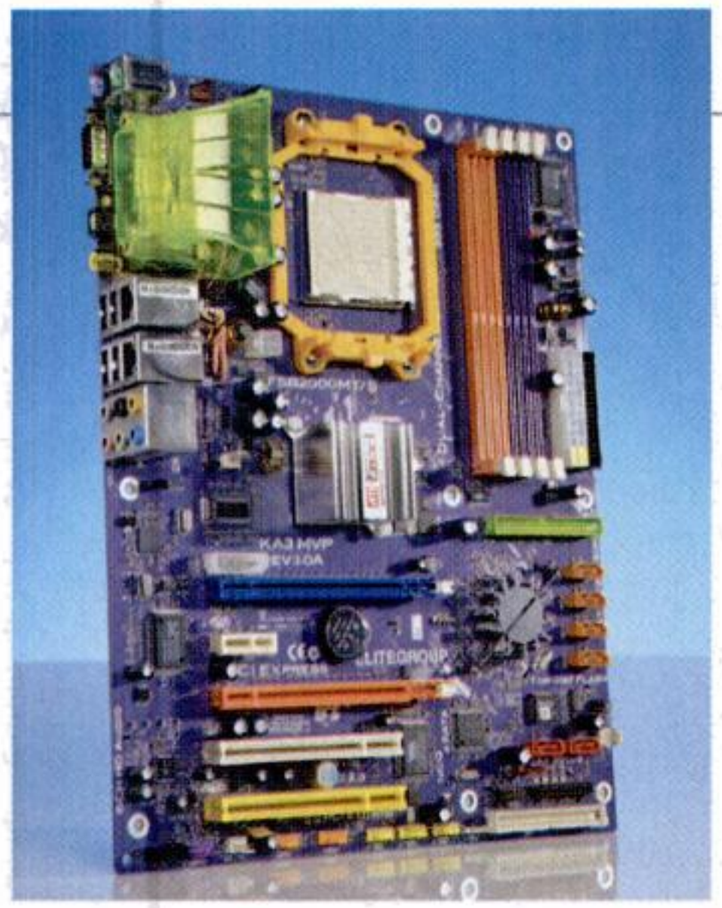
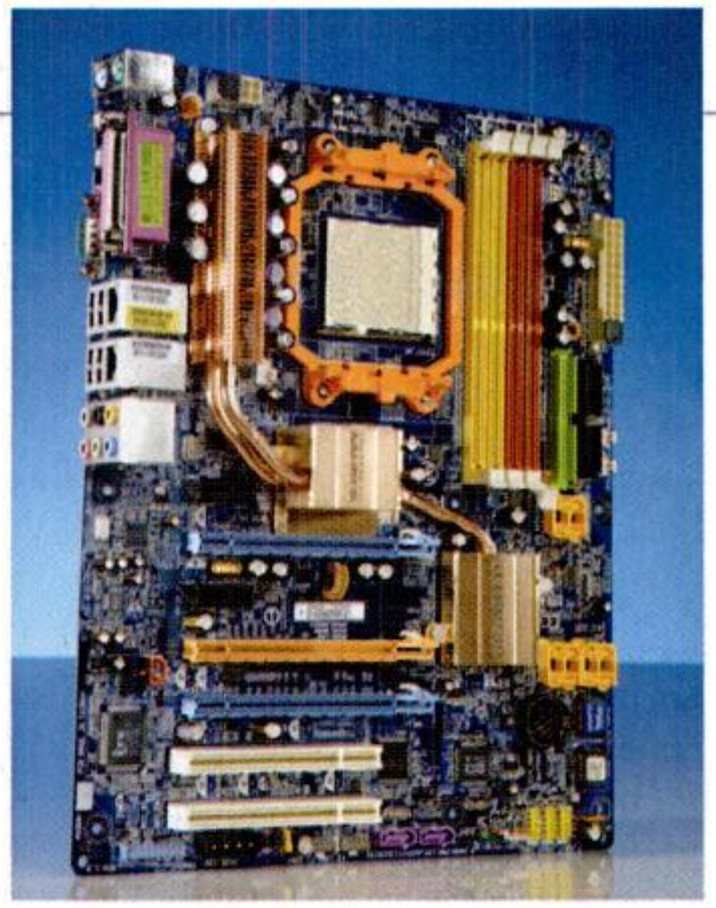


ECS' KA3 MVP Extreme features an on-mobo LED that lets you know when it's safe to yank the RAM.



Gigabyte's GA-M59SLI-S5 is the first AM2 board we've seen that can support a third GPU.

Gigabit Ethernet port—the second port runs at a mere 100Mb/s.

But performance is what really matters, and that's where the KA3 MVP Extreme lags slightly behind the two nForce boards. (Full disclosure time: We tested using a single GeForce 7900 GTX card to provide as apples-to-apples a test as possible, and the nVidia chipset might be better optimized for nVidia videocards in gaming benchmarks.) The only major hit is in hard drive performance. The KA3 MVP Extreme operated at a 7 percent deficit in *PC Mark 2005's* drive benchmark. ATI's original SB450 had a good reputation for disk I/O, so the slowdown surprised us. *PC Mark* isn't the definitive test for hard drive performance, so we'll delve deeper and report back.

While CrossFire isn't our cup of tea, the KA3 MVP Extreme holds its head up high for the AMD/ATI crowd.

ECS KA3 MVP EXTREME

+ MIKE AND IKE

A full dual x16 chipset without the heat: nVidia, take heed.

− GOOD & PLENTY

Weak hard drive performance hurts the KA3 MVP Extreme's rating.

8

$130, www.ecsusa.com

GIGABYTE GA-M59SLI-S5

In a world of "me-too" motherboards, Gigabyte is known for its "not-me" risky moves. The company was the first to integrate two GeForce 6800 GPUs onto a single card, and it was the first to make dual BIOSes standard. While the GA-M59SLI-S5 isn't as outside-the-box as previous boards, Gigabyte does include three x16 PCI Express slots (two perform at x16 speed, one runs at x8 speed), a much-improved videocard retention-clip system, and a SATA-to-eSATA adapter.

The board uses nVidia's nForce 590 SLI chipset and includes a big chunky heat pipe to cool it. We usually dig fanless heat pipes, but this one prevents you from installing long PCI-E cards in one of the x1 slots. SATA-port placement is more logical, though: All eight ports are easily accessible, even in an SLI rig.

Given the same test components and memory configs, we didn't expect the Gigabyte board to outpace the MSI. But the Gigabyte did manage to pull ahead in our low-resolution *Quake III* test, which stresses CPU, chipset, and memory performance. Oddly, the Gigabyte board lagged in the synthetic *SiSoft Sandra* memory test. The oddity didn't appear to affect any other benchmarks, however.

Where this board really shines is in features. When compared with the two 590 boards we looked at in September, we think the Gigabyte pulls ahead of the pack by offering eSATA and a third x16 PCI-E slot.

GIGABYTE GA-M59SLI-S5

+ TWIX

PCI-E options and a smart SATA-port layout make this the top board here.

− BUTTERFINGER

Heatsink blocks the first PCI-E x1 slot; no Wi-Fi.

9

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Zalman Reserator 2

Why are sequels never as good as the original?

Zalman's Reserator is a silent, fanless cooler that needs no introduction. Though we've praised the previous versions of this water cooler, Zalman has seen fit to completely redesign the newest Reserator model. And in doing so, it addresses the few issues people had with earlier versions, while unceremoniously introducing a few new issues.

The Reserator 2 differs in almost every way from its predecessor, the Reserator 1 Plus (reviewed Holiday 2005). The biggest change is the redesigned reservoir/radiator tank. We're not too stoked about its looks, but we love how small and thin it is—it's about the size of a desktop-replacement notebook. Zalman has also switched from the previous huge-tank-of-water-with-a-pump design to using natural convection to move the water through the system. Water flows through vertical channels that rise and fall through the tank's midsection in a snaking S pattern, transferring its heat to the tank's aluminum chassis to radiate heat out of the system. Zalman includes the same low-flow pump used in the Reserator 1 Plus, so it's virtually inaudible. Using a Molex power pass-through, you can even configure the pump to turn on and off with your PC—a nice improvement from the previous model, which was always off or on.

We love the flow meter on the front of the unit. It's much easier to see than the in-line meter on previous models. Zalman has also added an alarm to the meter, so if the impeller stops moving for 10 seconds, an alarm begins beeping quietly, allowing you to shut down your rig and investigate. There's also an LED above the flow meter, which you can turn off using the LED shut-off button on the front of the unit.

The radiator is not the only thing that's new: Zalman also included new water blocks featuring slightly improved designs. The CPU block now sports an acrylic cap and uses a more efficient pin-matrix design, as opposed to the simple row of blocks found on the previous Reserator. The GPU block has tube-mounting barbs that rotate freely (usually they're fixed in place), which reduces the chance of tube-kinking significantly. In a puzzling departure from the previous model, Zalman left off the RAM heatsinks for the videocard this time around. Zalman says RAM sinks are insufficient for high-end GPUs, so they weren't included. Instead, it's suggested you purchase an optional Zalman RAM water block—which is bunk. Considering the unit's price, a RAM water block, or at least RAM sinks, should be included.

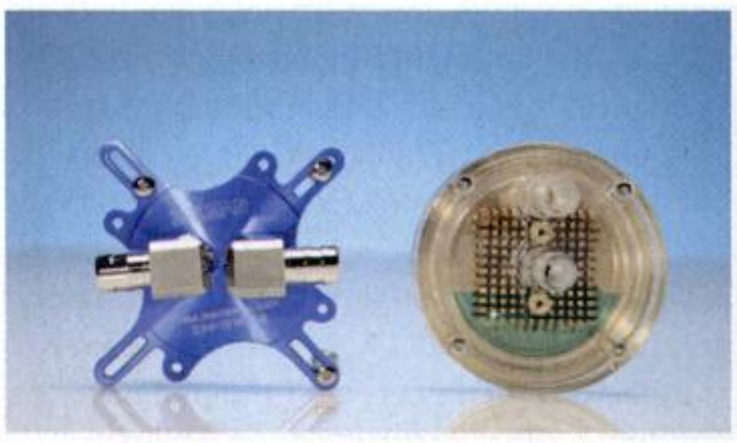
The kit also doesn't support socket AM2 right now, but Zalman says you can request an AM2 retention mechanism if you need it. Who wants to do that? Zalman says eventually AM2 support will be included in the box. And like before, motherboard removal is still required for all S939 and LGA775 processors. Phooey on that as well.

Installation took about an hour, and was relatively painless (aside from motherboard removal, of course). Performance was impressive on our test bed, which includes an FX-62 CPU and nVidia 6800 GT videocard. Both parts ran at decent temps under full load for several days, with nary a peep to be heard.

In the final tally, the new Reserator is definitely improved, but still has shortcomings. The price surprised us as well—this thing is way expensive, and in our opinion, not worth it. The Reserator 1 Plus costs half the money and runs just as quiet.

—JOSH NOREM

The Zalman Reserator has been reborn as a slim, svelte, rectangular unit rather than a towering, um, tower.



The CPU block (right) features an acrylic cap and a pin-matrix design, and the GPU block (left) features swiveling barbs to prevent tube kinks.

BENCHMARKS

	RESERATOR 2	RESERATOR 1	STOCK HSF
AMD FX-62			
IDLE (C)	**35**	**35**	40
100% LOAD (C)	**47**	52	49
GEFORCE 6800 GT			
IDLE (C)	**44**	N/A	60
100% LOAD (C)	**55**	N/A	85

Best scores are bolded. All temperatures were measured using the onboard sensors, using the utilities provided by the motherboard manufacturer. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour.

ZALMAN RESERATOR 2

J. NO

Good performance and silent running. Handy flow meter!

J. LO

Too expensive! Must remove mobo to install.

7

$390, www.zalmanusa.com

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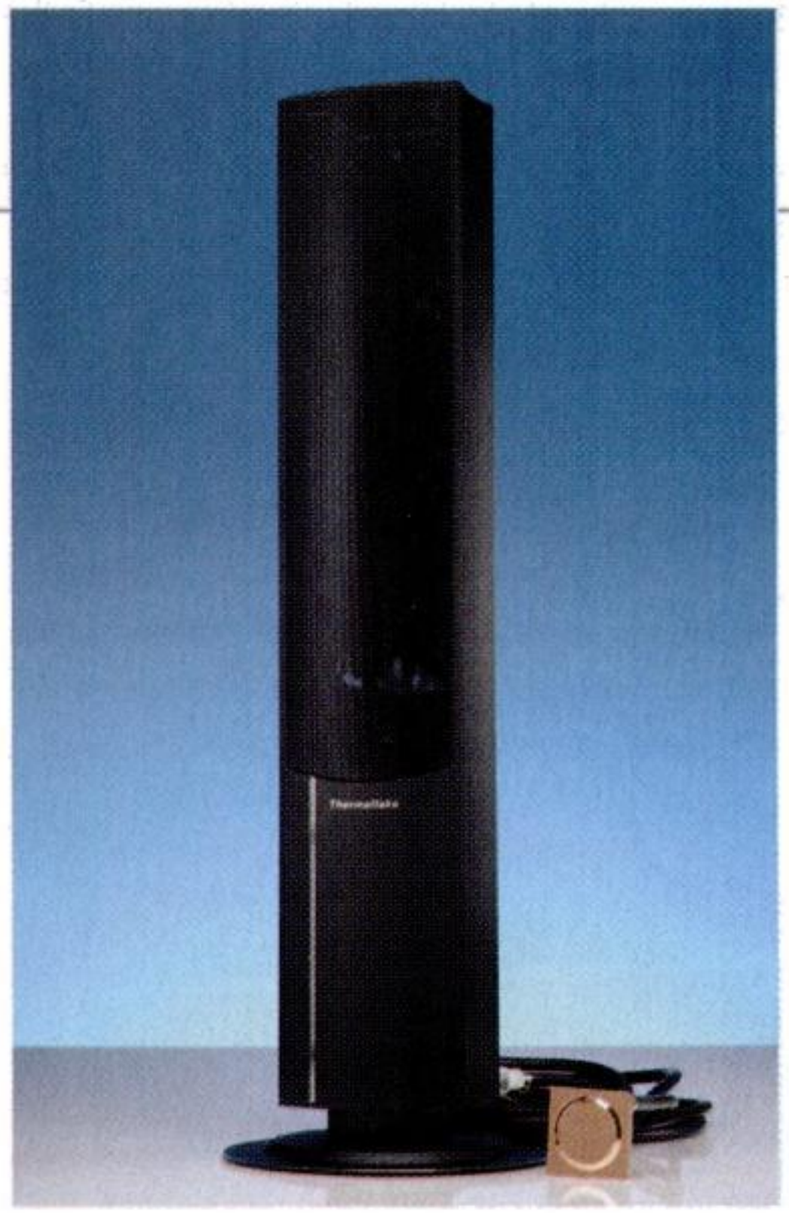
Thermaltake Symphony Mini

Good things come in small(er) packages

Thermaltake seems to be the only manufacturer designing water-cooling kits specifically for the home-theater crowd, and we applaud the company's *cojones* for doing so. Because most folks want their HTPC to be as quiet as the rest of their A/V components, water-cooling is an excellent way to maximize performance while minimizing noise. The latest Thermaltake HTPC cooler is a smaller version of the giant Symphony, which is itself a great cooler, albeit freaking huge and way too pricey at $500. The Mini is much more affordable, and manageable.

The idea is to place it somewhere near your HTPC cabinet so that it blends right in; it looks just like a tower speaker. Most people would never know the truth—that behind its mesh grill sit a reservoir and a massive aluminum radiator cooled by three quiet 12cm fans running at a mere 1,400rpm. The setup uses a dual-pump configuration, and fits all late model CPU sockets, including BTX designs. It ships prefilled with coolant, and the CPU water block comes attached. Mobo removal is required for Intel systems, but not for AMD. We love the Mini's quick-detach hoses, which make moving your system around much easier; and we love that Thermaltake included enough tubing to place the tower 7 feet from your rig.



Though it resembles Zalman's fanless Reserator 1 Plus, the Symphony Mini sports three 12cm fans to cool its bodacious radiator.

In our tests, we compared the Mini to Zalman's Reserator 1 Plus (reviewed Holiday 2005). The Symphony outperformed the fanless Reserator by a few degrees, which we attribute to its triple-fan setup. However, it ran nearly as quiet as the Reserator. We could only hear the fans when we placed our ear right next to the Symphony's tower. Of course, there's a catch: The Symphony Mini only cools the CPU, and it's not upgradable. That makes it damn pricey, especially considering that the Reserator 1 Plus costs the same, and includes a GPU block. For our money, the 1 Plus is a better deal, but the Symphony Mini is a close second.

—JOSH NOREM

BENCHMARKS

	SYMPHONY MINI	RESERATOR 1 PLUS	STOCK HSF
IDLE (C)	**32**	34	44
100% LOAD (C)	**44**	47	53

Best scores are bolded. Both coolers were tested on an AMD FX-60. All temperatures were measured via the Asus A.I. Booster software. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved by running CPU Burn-in for one hour.

THERMALTAKE MINI **9**

$235, www.thermaltake.com

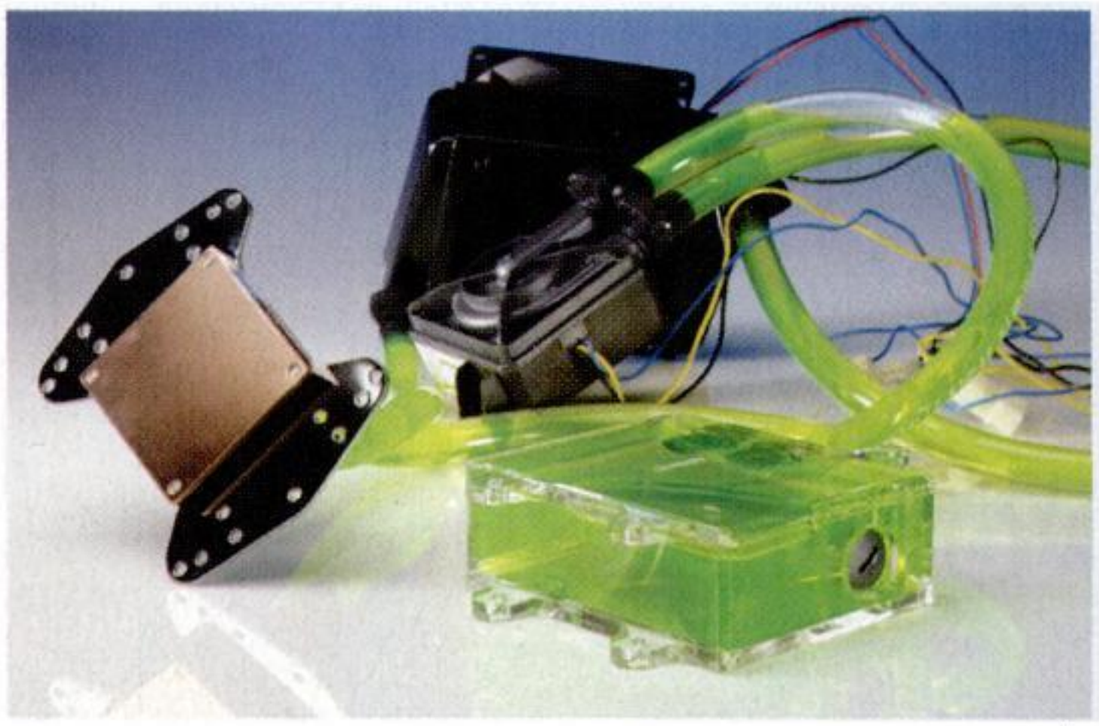
Swiftech H20-80 Micro

Big cooling with a small footprint

Swiftech's dual-radiator Apex Ultra water-cooling kit is the current cooling record-holder (in our Lab, at least), so when the company told us it had a Micro kit that was designed to fit in tight, cramped cases, we were intrigued. Like most hardcore PC users, we assumed a small radiator couldn't get the job done—at least without making a ton of noise. Boy, were we ever wrong.

The kit uses Swiftech's best components, including the eerily quiet MCP350 12-volt pump, which pushes the water around like a schoolyard bully. It uses vinyl tubing with a 3/8-inch internal diameter and a tiny transparent reservoir. The cooler's secret weapon is an 8cm radiator—an all-new "quiet performance" model optimized for low-flow fans. The kit includes a 12V-to-7V fan adapter to quiet the fan a smidge more. Swiftech includes a small bottle of its Hydrx UV reactive anti-algae additive that you must combine with distilled water (water is not included). Every component in this kit is top-of-the-line, and they work extremely well together.

During testing, the teeny radiator/fan setup provided surprisingly good performance for such a small package. Some reservoirs make loud sloshing noises, but not this one—it is the quietest unit we've ever tested. Sure, 50 C might seem a bit hot under load, but it's just a few degrees hotter than what we're used to seeing on our FX-60. One very cool feature of the Micro is that, unlike other Swiftech kits, this one fits entirely within your case. Awesome!



Did someone disembowel an alien? Swiftech's Micro cooling kit uses the ever-popular green slime UV liquid.

Sure, the instructions are as dense as pound cake, but that's par for the course with Swiftech. We don't have any other gripes at all. If you're looking for an all-internal kit, be sure to put the Micro on your shopping list.

—JOSH NOREM

BENCHMARKS

	H20-80 MICRO	DANGER DEN CUSTOM KIT*	STOCK HSF
IDLE (C)	36	**38**	44
100% LOAD (C)	50	**45**	53

*Best scores are bolded. All temperatures were measured via the onboard sensors, using the utilities provided by the motherboard manufacturer. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour. * The Danger Den kit listed was cooling both the CPU and GPU*

SWIFTECH H20-80 **9**

$180, www.swiftnets.com

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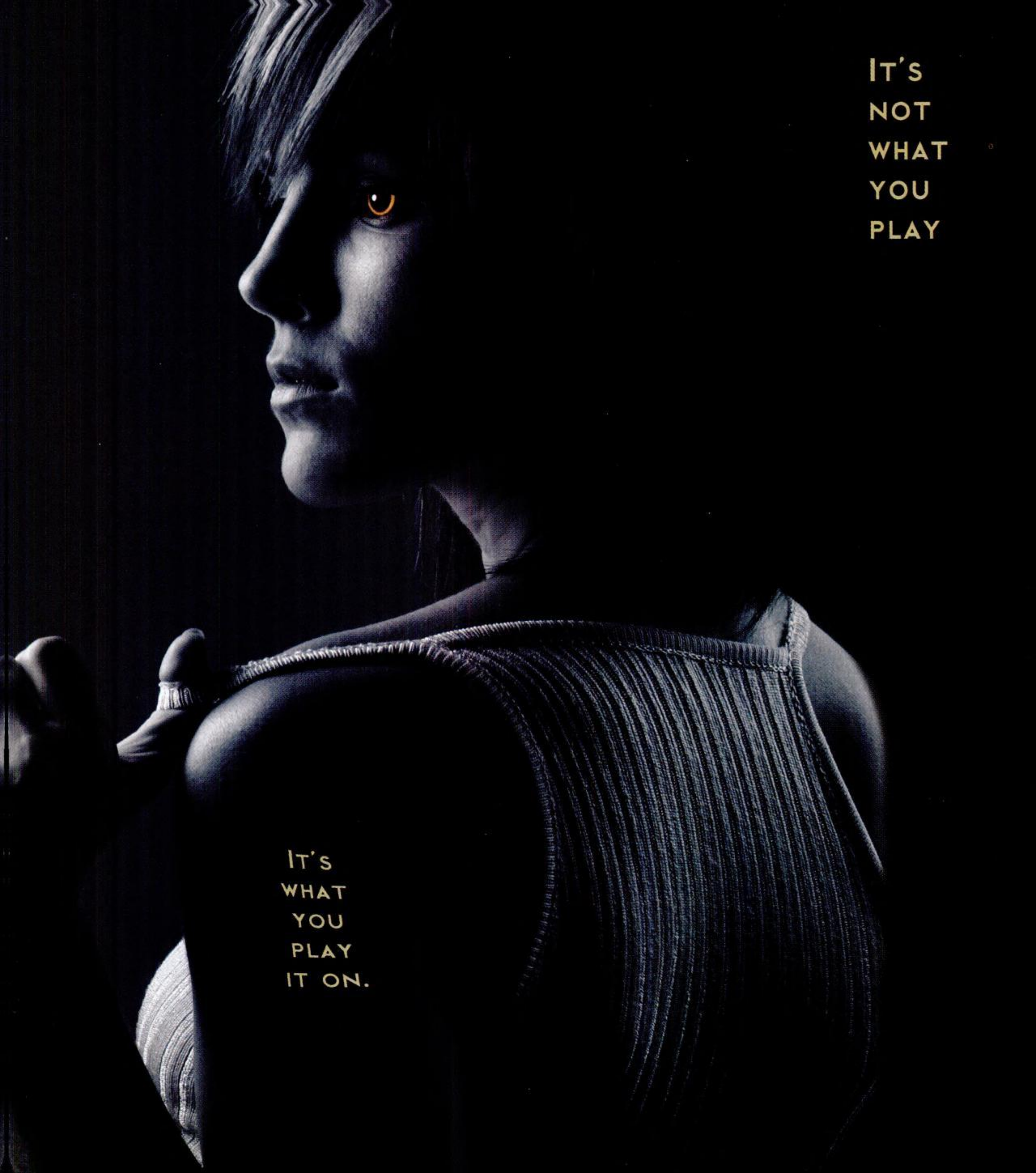

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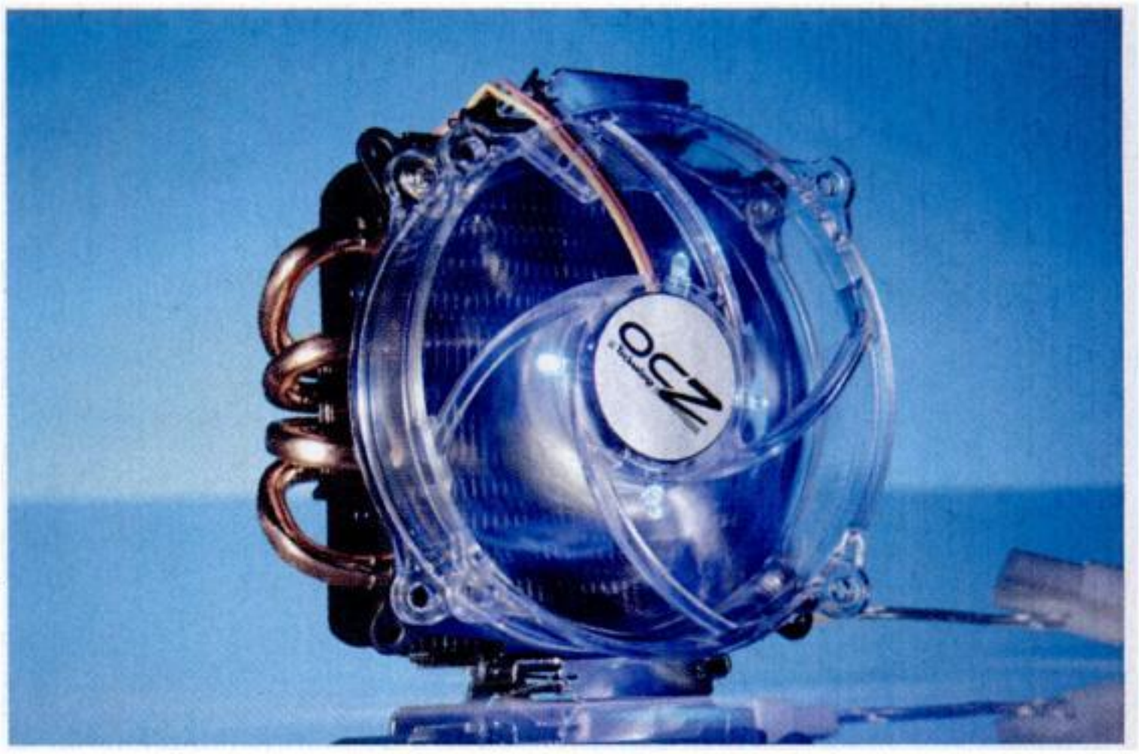
OCZ Tempest

Not a bad cooler, but not really good either



OCZ's Tempest cooler looks slick, but don't be fooled by the bling—it's just a midrange cooler behind the glitz and glamour.

This month memory-maker OCZ wades into the hotly contested CPU cooling arena with its blingy Tempest cooler. Though the Tempest has the signature OCZ flair, we were let down by its midrange performance and loud operation.

At first glance, it looks like a standard CPU cooler, if somewhat milquetoast: In a world where every high-end heatsink/fan is the size of a small mammal—a necessary evil when surface area largely dictates cooling performance—the Tempest is more like a vole. Pick it up, though, and you'll do a double-take. It sports a huge copper base plate, which is titanium-coated to prevent oxidation, and very heavy. A heavy cooler is usually a good cooler, and the Tempest strikes an uncommon balance of heft without being as tall or wide as much of its competition.

Installation is fairly simple, though a bit time intensive. On our AMD platform, we had to attach two little arms to the cooler's base plate, and then attach those arms to the stock retention mechanism with two included screws. Intel systems require mobo removal along with installation of an included backplate.

BENCHMARKS

	OCZ TEMPEST	ZALMAN CNPS9500
IDLE (C)	**36**	39
100% LOAD (C)	50	**46**

Best scores are bolded. All temperatures were measured via the onboard sensors, using the Asus A.I. Booster utility. Idle temperatures were measured after 30 minutes of inactivity and full-load temps were achieved running CPU Burn-in for one hour.

During testing, the Tempest delivered slightly better performance than the stock FX-60 cooler from AMD, but it's not in the same league as top-notch coolers like the Zalman CNPS9500, Tuniq 120, or the Thermaltake Blue Orb II. Think respectable but not mind-blowing. The 9.2cm fan, however, with its bright blue LEDs, is too loud for our tastes. It's rated at 33dBA, spins at 2,500rpm, and is always audible. If we bought this cooler, our first step would be to use *Speedfan* or a similar utility to slow it the heck down.

All in all, we have to say it's a disappointing freshman attempt from OCZ. Sure, the cooler is adequate, and it certainly looks nice, but we had high expectations of the company and this cooler fell far short of them.

—JOSH NOREM

OCZ TEMPEST **7**

$55, ocztechnology.com

ViewSonic Cine1000 DLP Projector

Get the BIG picture

ViewSonic's versatile, portable Cine1000 DLP video projector works as well on a coffee table as it does hanging upside down from the ceiling.

Crave the big-screen home-theater experience? Stuck with a small-screen budget? Take a long look at the Cine1000—this versatile DLP projector is street-priced at just $900.

ViewSonic's previous projectors were targeted at corporate buyers, and signs of that heritage remain in the Cine1000's board-room appearance and non-backlit remote. This is the company's first 16:9 aspect ratio projector, and it has packed an amazing collection of features into a supremely affordable package.

The diminutive box sports a native resolution of 854x480 pixels (720p and 1080i are supported via scaling) and a raft of I/O ports, including HDCP-compliant DVI-I input; composite, component, and S-Video inputs; analog RGB input and output (enabling you to pass the video signal through to a monitor); stereo audio inputs (RCA and 1/8-inch); stereo audio output (1/8-inch, for loop-through applications); and RS-232 and USB data ports.

DLP pixels are created by thousands of tiny mirrors, so these projectors are usually brighter than their LCD competitors in less-than-optimal lighting conditions. But since DLP also renders fonts with fuzzy edges, we can't recommend using this projector for text applications—including web browsing (movie subtitles are large enough to be unaffected).

The Cine1000 filled all 58 diagonal inches of a Draper Piper HDTV projection screen with gorgeous color from a throw distance of just six feet (we chose the $318 Piper for our testing because it—like the lightweight Cine1000—is easily transportable). Given enough elbow room, the Cine1000 can project an image as large as 230 diagonal inches.

The projector did a fab job of scaling to a variety of PC resolutions for gaming, and *Quake 4* looked absolutely stunning splashed across the huge screen at 1280x720. When it came to watching movies, however, we got better results with the output from a stand-alone DVD player. Because our videocard couldn't drive the projector at its native resolution, widescreen films such as *Crouching Tiger, Hidden Dragon* wound up severely letterboxed—filling the screen horizontally, but leaving broad swaths of the top and bottom of the screen vacant. But with all those inputs, you can easily connect both devices.

—MICHAEL BROWN

VIEWSONIC CINE1000 **9**

$1,200, www.viewsonic.com

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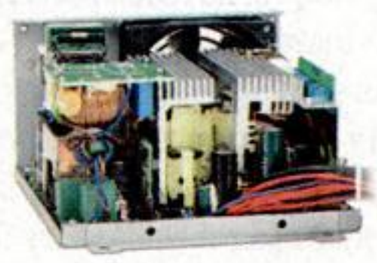

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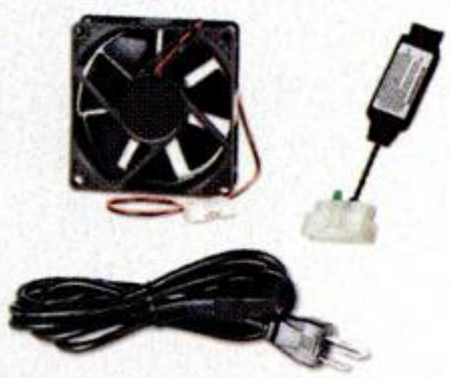

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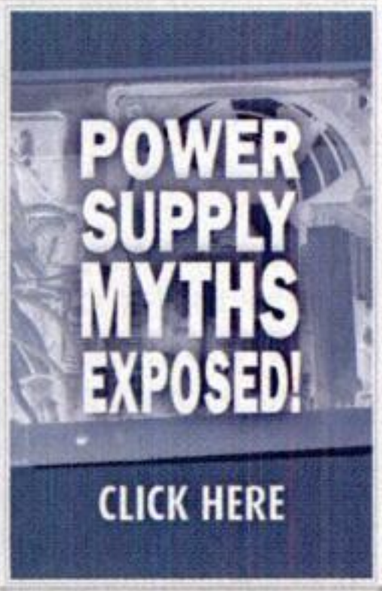

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Seagate eSATA External Hard Drive

Blazing-fast external interface fires a shot across USB's bow

Seagate is on a roll—it was the first to bring perpendicular recording to the desktop market, and now it's the first out of the gate with external SATA.

We've been waiting several years for eSATA (external SATA, that is) to show up. This month we're happy to see the first eSATA drive actually arrive to market. If you're looking for an external backup drive that's much faster than a standard USB or FireWire drive, Christmas has come early.

Now, astute readers will probably say "*Maximum PC*, don't pull my leg. You reviewed an external SATA drive back in June 2004." OK, you got us on that one, but that CMS Velocity drive wasn't a true external SATA drive (it didn't adhere to the official eSATA specification). The Seagate eSATA drive, however, is the real deal. It uses an actual external SATA cable, which is thick and shielded to protect against interference. The 5-foot-long cable plugs into the included Promise eSATA controller, which runs at SATA 3G speeds and rides the PCI bus.

The big news with this drive is that rather than riding the pokey USB or FireWire bus (as other external drives do), it runs on SATA, and the difference shows in the benchmarks. On average, the eSATA drive runs almost twice as fast as a comparable USB drive, in both read and write speed, which is incredible. Its access times are much slower than the same model internal drive, however, hovering in the mid-20 millisecond range.

There's only one problem: We had trouble with the included backup software. It's *BounceBack Express* from CMS, which we've found plenty capable in the past. But the UI has been revamped to give it a fresh look, and the new version crashed repeatedly on our test system.

Seagate's eSATA drive is the fastest backup drive available, and you can even stack several drives on top of each other and run them in RAID array if you have an eSATA RAID controller. It's hurt only by the fact that a single drive's 500GB capacity is middling, and the software is buggy.

—JOSH NOREM

SEAGATE eSATA DRIVE **8**

$370, www.seagate.com

SoundMatters FullStageHD

Hum a few bars and these speakers will fake it

The FullStageHD delivers big stereo sound from a compact package, but stumbles badly trying to deliver surround sound.

It's no myth that two-box speaker systems can produce compelling surround sound. Cambridge SoundWorks' SurroundWorks 200 and Yamaha's YSP-800 (paired with a good subwoofer) pull it off using head-related transfer functions and digital audio-projection technology, respectively. SoundMatters would have us believe its FullStageHD can work the same magic, but we're calling bunk.

The $600 system consists of two components: A crescent-shaped cabinet houses an amplifier, a built-in subwoofer, and small speakers for the front, rear, and center channels. A larger powered subwoofer delivers added oomph to low-frequency effects. FullStageHD sparkles with audio CDs. We reveled in The Blind Boys of Alabama's cover of Tom Waits' "Jesus Gonna Be Here" as the upright bass' wood and catgut resonated perfectly with the vocalist's gravelly tenor.

We weren't nearly as pleased when we tested the system's theatrical capabilities, using Tim Burton's underrated remake of *Planet of the Apes*. The system succeeded in placing audio events on a wide and tall sound stage, and the subwoofers did a stellar job producing coherent bass. But at no point did we ever perceive that audio events were originating anywhere other than from the front of the room.

After obtaining disappointing results from several other movies, we decided to switch gears and listen to some surround-sound music. We'd just received This *Binary Universe,* the latest DTS release from electronica pioneer Brian Transeau (BT), so we dropped it in our DVD player.

After listening to 10 seconds of silence, we spent the next few minutes checking settings on the FullStageHD and on the DVD player. Then we double-checked the cable connections between the two devices. And then we finally decided to RTFM. It turns out the FullStageHD *doesn't support* DTS. We were even more appalled to learn that SoundMatters doesn't license Dolby's technology, either—it uses an old Zoran DSP chip and an audio algorithm that *emulates* Dolby Digital.

SoundMatters offers a respectable compact sound system for audio CDs, but we thought we'd left this kind of surround-sound hokum back in the 1990s.

—MICHAEL BROWN

SM FULLSTAGEHD **5**

$600, www.soundmatters.com

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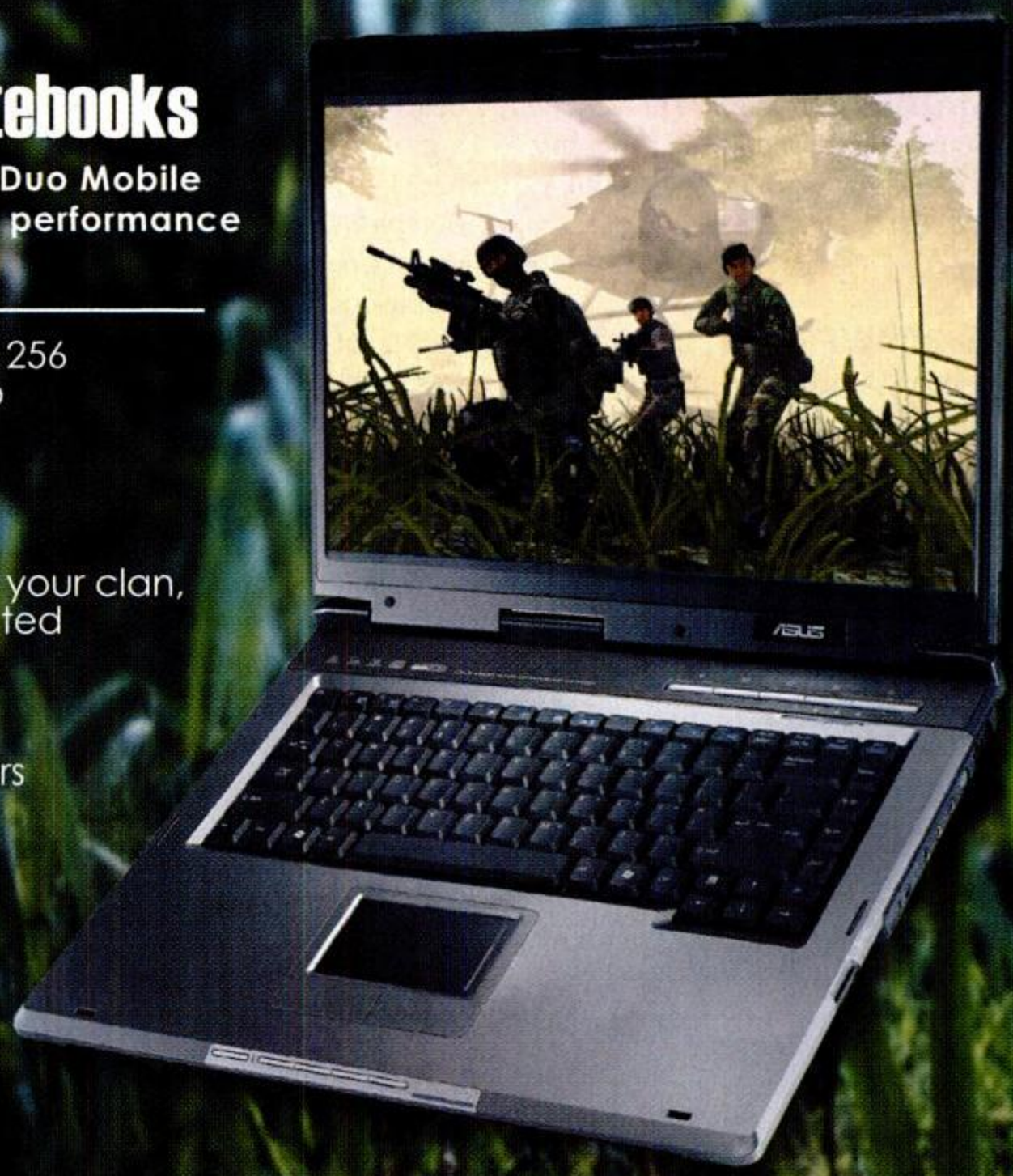

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LCD Lowdown

These wide screens are large, but are they in charge?

By now we can all agree that 19- and 20-inch screens are totally insufficient for serious computing. Yes, you can pair two together for more real estate, but the more convenient solution is to buy a single big-and-wide 23/24-inch desktop LCD. There are certainly plenty to choose from. Hot on the heels of our September roundup of four such beasts, we present two more for your consideration. Can either top the 9/Kick Ass verdict that Dell's 2407WFP received in that review?

—KATHERINE STEVENSON

PHILIPS 230WP7

Philips' 23-inch LCD won't win any beauty contests. It's not ugly, per se, but its silver and black plastic chassis looks and feels a bit chintzy. Fortunately, it offers the full complement of adjustment options—a generous 7 inches of height clearance (by way of a telescoping neck), along with swivel, tilt, and portrait functions. It also offers four USB 2.0

Philip's 230WP7 costs a bit more than the Dell 2407 we reviewed in September, and offers less.

ports. Onscreen display (OSD) buttons across the front bezel are comprehensive and fairly intuitive; or you can perform all the same functions using the bundled *SmartControl* app, which adds an embedded tab to your Display Properties windows—nifty.

As with the display's physical appearance, we were initially unimpressed with its *DisplayMate* (**www.displaymate.com**) performance. One of our first tests is always the Dark Screen, which reveals how well a screen can produce a deep, uniform black. In this, the 230WP7 appeared splotchy and uneven, with signs of backlight showing through at various places. But the 230WP7 redeemed itself with strong grayscale skills, producing smooth, accurate gradations of up to 256 steps. Its color reproduction of high-res digital photos and video was solid when viewed straight on, but the picture loses a lot of contrast and depth when viewed off-axis.

Like the HP LP2465 that we reviewed in our September roundup, Philips' LCD had some trouble reproducing a stream of image patterns in the speed test *Pixel Persistence Analyzer*. Rather than moving across the screen in a steady, rapid fashion, the images stuttered at regular intervals. The stutter was not immediately apparent in our game tests—in fact games looked pretty darned good on Philips' screen (again, when viewed straight on), but when we moved our character side-to-side across the screen (to mimic the action of the benchmark), we observed an almost imperceptible periodic hitch.

PHILIPS 230WP7

+ CARAMEL CORN
Fully adjustable ergo stand; four USB ports; good grayscale performance.

– CANDY CORN
Flimsy bezel; poor off-axis; slight hitch in side-to-side action.

7

$1,000, www.consumerphilips.com/lcdmonitors

SPECS

	PHILIPS	EIZO
SCREEN SIZE	23 inches	24.1 inches
NATIVE RESOLUTION	1920x1200	1920x1200
INPUTS	DVI, VGA, 4 USB 2.0	2 DVI, 2 USB 2.0

EIZO FLEXSCAN S2410W

At almost twice the cost of Philips' LCD, Eizo's FlexScan S2410W ought to be pretty nice. And in a lot of ways it is. The screen is a full inch and change bigger than the Philips'. And its black cabinet is more solidly built—stately, even. We'd like it a whole lot more if we could adjust the screen's height via a conventional telescoping neck (like Philips'). But the S2410W sports Eizo's patented ArcSwing stand, so the screen moves up and down on a set of tracks embedded in the displays broad concave neck. The height maxes out at around 2.5 inches off the desk's surface, and tilting the screen forward and back requires undue effort. It's more unique than convenient. Same goes for the twitchy touch-sensitive OSD buttons on the front of the bezel. Bundled software lets you perform all the OSD functions with your mouse and keyboard, and lets you create and tweak settings profiles for various content.

Eizo's S2410W sports a solid build, which you have to wrassle to make any height or tilt adjustments to the screen.

In our *DisplayMate* evaluation, the S2410W produced an almost totally uniform dark screen, except for backlight seepage in the upper corners. In grayscales, we observed red, green, and blue hues throughout the steps, which indicates color-tracking inconsistencies among the RGB channels. And the extreme dark and light ends of the scales lacked distinction. Still, colors and contrast seemed pretty strong in most of our high-res test images, although some detail was lost in dark areas. This didn't hobble the predominately dark scenes of *Batman Begins*, however, thanks to the screen's Movie mode, which adjusts the saturation, contrast, and gamma, for a vibrant cinematic experience. In games, the environments looked colorful and bright, and the action was free of flaws.

EIZO FLEXSCAN S2410W

+ PEANUT BUTTER
Nice big screen; sturdy build; strong image reproduction.

– PEANUT BRITTLE
Limited stand adjustability; color-tracking issues; crazy expensive.

8

$1,700, www.eizo.com

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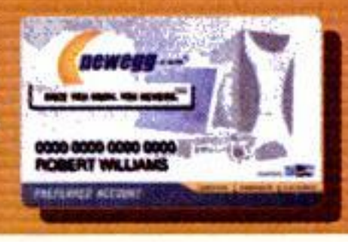

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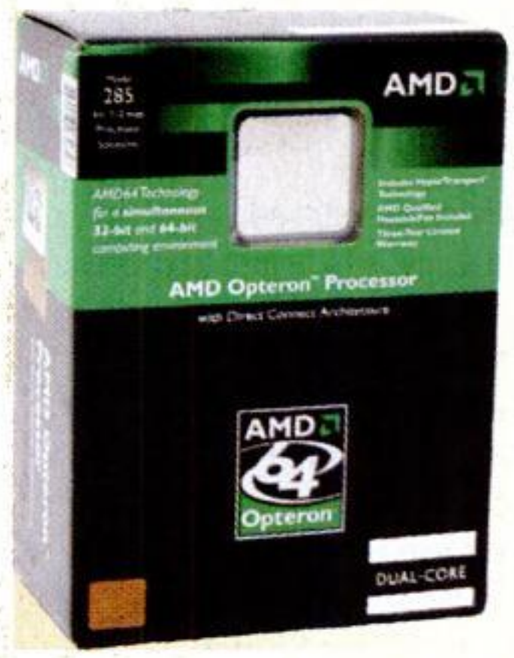

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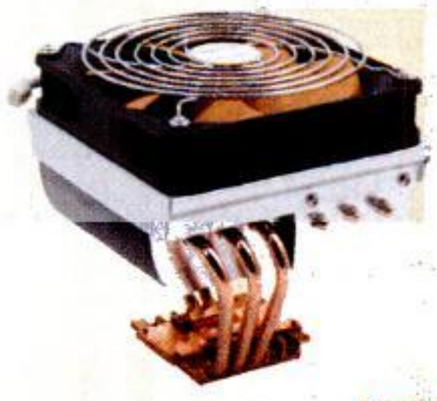

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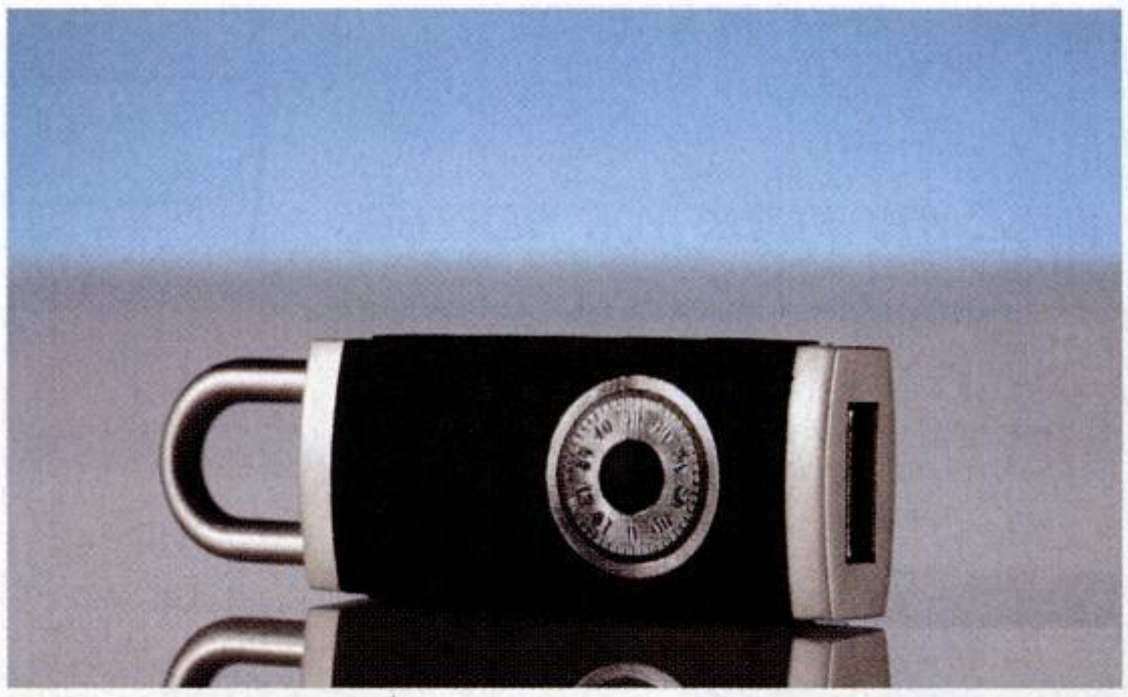
GuardID ID Vault

What's it worth to make your life more secure?



ID Vault securely handles your web logins for you.

Today's simple username/password system is a single-factor authentication mechanism—your credentials are the only information necessary. When an evildoer has that information, whether it was stolen with a keylogger or a "phishing" email, you're screwed.

Two-factor authentication schemes are much more secure. They require you to know something and to *have* something before your account information is unlocked.

GuardID tries to create a two-factor authentication scheme with its clever ID Vault USB key, err, "password lock-box." You program the key with a master PIN, and then browse to, say, your bank's website. Once there, ID Vault safely encrypts and stores your user name and password on a smart chip in the key. You will then need the key to be in your PC when you want to access that website. Furthermore, anytime you visit a website that requires a username and password, the ID Vault software will ask if you want to add that info to the vault.

With the account information safely on the key, you never have to type your password or username again—just your master PIN, via an onscreen keyboard, which is resistant to keylogging.

The ID Vault compares financial website IP addresses with its own database of known addresses and alerts you to a possible phishing attempt if the address is incorrect. This *should* protect you if your PC's hostfile or even if your ISP's DNS cache has been poisoned to redirect you from Wells Fargo to a server in Paraguay.

We found the ID Vault to be a great concept but somewhat lacking in execution. First, the key relies on Microsoft's .Net runtimes, so it's not particularly portable. *Firefox* users are also out of luck, for now at least. And even worse, if you're at a public Internet terminal or a friend's house, you can't use the key without installing software. That effectively neutralizes the key for people who lack security discipline. For paranoids who would never use an unclean computer for sensitive work, the lack of portability isn't an issue. But still, why not store the software you need on the key itself; and couldn't it be a little smaller?

Despite these limitations, we see potential here. If the company can figure out a guest mode that doesn't require software installation, it could be a kick-ass device. Right now, it's suited primarily for the hyper-vigilant.

—GORDON MAH UNG

GUARDID ID VAULT **7**

$49, www.idvault.com

DVD Copy 5 Platinum

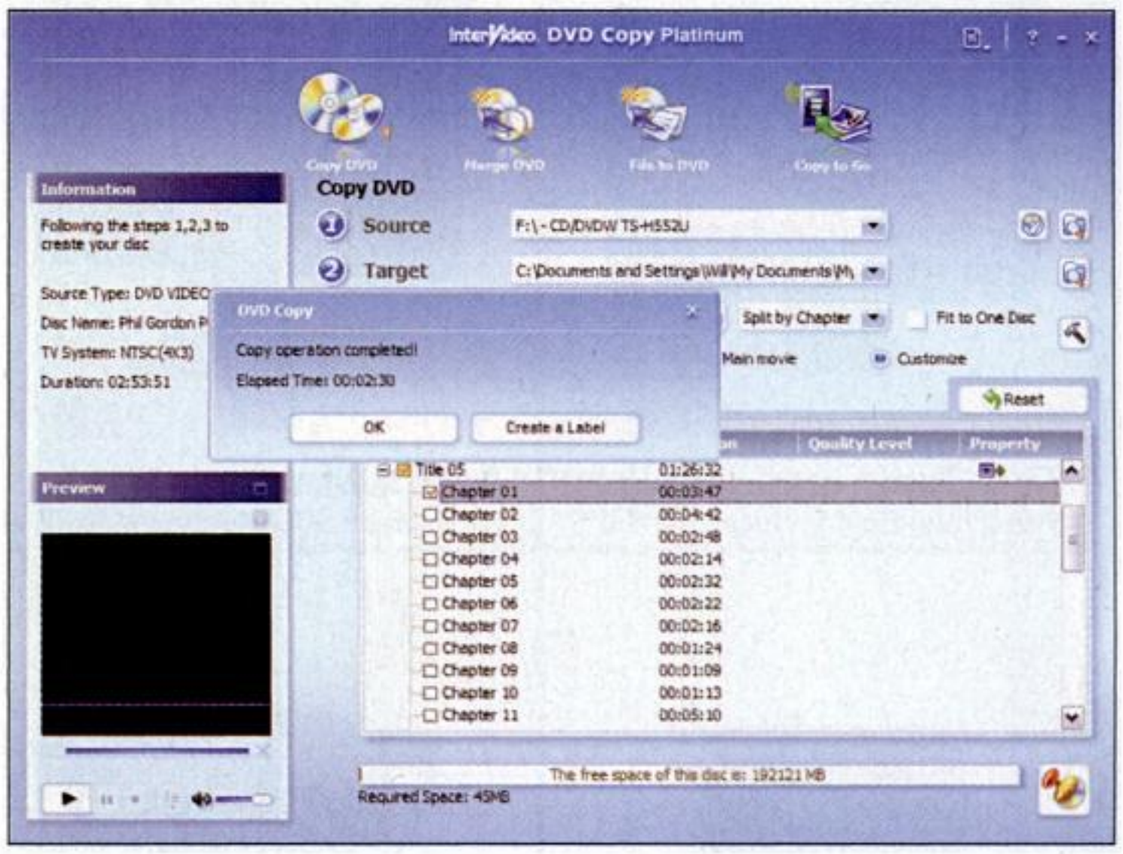
Our favorite DVD ripping program gets even better

Anyone who's ever ripped a movie using the free *AutoGK* bundle knows that it's effective, but that it's also a pain in the ass to use. Assuming you get all the different bits and pieces of *AutoGK* working together, there's a pretty strong chance you'll end up with a great-looking movie and a crisp-sounding audio track that are completely out of synch with each other. That's just what you want after spending two hours ripping a disc to Divx—*not*. We love *DVD Copy* because it takes the guesswork and trial-and-error out of the DVD ripping process.

For ripping DVDs to Divx, WMV, H.264, or just another blank DVD, there's no easier piece of software to use. *DVD Copy* is easy to configure, powerful, and fast. To rip a disc, simply select the portion of the disc you want to rip (or you can let the software automatically select the main movie for you), select a codec, select the target resolution, the audio track, and the subtitles, and press the rip button. Performance varies by codec, but the multithreaded WMV and Divx encoders will speed through a full-resolution DVD transcode at about a 1:1 ratio. You can manually set the output to match your player—even on portables like the PSP and iPod Video.

This latest version adds the ability to rip entire DVDs as images, which you can then add to the batch processor's queue. The batch processor lets you transcode multiple movies, one after the other, even if you're not there to change the disc every few hours. Although the batch editor is a touch confusing, it's worth the hassle the first time you encode six movies overnight.

But, naturally, there's a catch. *DVD Copy* doesn't include any software



DVD Copy 5 Platinum **makes it super-easy to rip your DVDs, but only if you have software to strip the copy protection.**

that will decrypt CSS-protected DVDs—in other words, most commercial DVDs. In order to rip those, you'll need software that decrypts the disc's contents on the fly, such as *AnyDVD* (**www.slysoft.com**). Having to purchase *AnyDVD* adds another $40 to the cost of the program, and kills any chance of a Kick Ass award.

—WILL SMITH

DVD COPY 5 PLATINUM **9**

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Mousing Madness

With only three buttons, this mouse is not for hardcore gamers, but it delivers smooth action for a great price.

Which mouse will find a room in your house?

The computer mouse sure has come a long way from a sensor embedded in a block of wood, found in the basement of some Xerox lab, hasn't it? These two new mice from Razer and Logitech offer great performance at a budget price and amazing new haptic features, respectively.

—WILL SMITH

LOGITECH MX REVOLUTION

We like the smooth-spinning mouse wheel on Microsoft's Intellimouse Explorer 4 for application work and web browsing, but its detentless design leaves much to be desired when playing games where you use the mouse wheel to select your weapons. Until now, you couldn't have it both ways. Logitech's MX Revolution sports a wheel that will spin for the better part of a minute, but when you're ready to jump into a game, just press down on the middle button and the mouse wheel shifts to a standard clicky mode.

It's not magic; there's a force-feedback motor connected to the wheel. With the included software, you can set the mouse wheel's mode to shift on an application-by-application basis or by using one of the nine buttons on the mouse, or you can keep it locked in either mode. It sounds like a goofy feature, but it's super-handy to be able to flick your middle finger once and scroll all the way to the bottom of a long *Word* document.

We're not generally big fans of cordless mice. They often don't perform well, and lack the sensitivity we require for gaming, *Photoshop* work, or just day-to-day mousing tasks. While we experienced a slight startup lag with the MX Revolution in our office-testing environment, it wasn't present when we tested away from all the radio interference at our work site. In either case, once the mouse was moving, we didn't have any problems.

The physical shape of the MX Revolution is comfortable even for extended sessions. For the most part, the button placement is excellent. The two side-mounted buttons are perfectly placed, and we love the zoom toggle switch hidden in the thumb well. Like the wheel, you can configure it on an app-by-app basis to use either its application-switching mode or the zoom mode. (In games, it works like a typical scroll wheel, perfect for switching weapons.) The only questionable button is the Search button, which automatically searches the Internet for any words you have highlighted. It works well, but it's not a feature we see a major need for.

We got around five days of use from a single charge of the rechargeable batteries, and the laser sensor is precise enough for the pickiest person. We'd love to see buttons dedicated to on-the-fly sensitivity switching, instead of the largely useless search button.

The new design of Logitech's MX Revolution is spiffy, but the super-spinny scroll wheel kicks serious ass.

LOGITECH MX REVOLUTION

ITCHY
Newfangled scroll wheel kicks serious ass. Uber-comfortable design.

SCRATCHY
Search button is goofy. Slight lag on startup

9

MAXIMUM PC KICKASS

$100, www.logitech.com

RAZER KRAIT

We've traditionally slammed Razer mice because their oversize buttons are too easy to accidentally click and their low-profile ambidextrous design hurts our hands over

long sessions. The new Krait ditches the obnoxious, impossible-to-click side buttons that we detested on the Copperhead model and streamlines the overall shape of the mouse, for a mousing experience that had us pleasantly surprised.

The Krait's 1600dpi optical sensor delivers Razer-style pixel-perfect accuracy. Its super-slick feet glide across our mouse pad with practically no drag at all, and its buttons deliver just the right resistance—neither too difficult nor too easy. The illuminated scroll wheel and side rails make it easy to see the Krait in a dark room. While this is one of the better Razer mice we've tested, it's still far from perfect.

Although you can change the sensitivity on the fly using Razer's software, you shouldn't plan on using that feature for this three-button mouse. Because the on-the-fly sensitivity adjustment requires that you map a button on the mouse to use that feature, you'd have to map the right mouse button to actually enable the feature. While we love dialing down the mouse speed when we're sniping, we wouldn't sacrifice the ability to zoom in *Battlefield 2* to get extra sensitivity. Still, with its kick-ass $30 street price and pin-point accuracy, it's pretty easy to recommend.

RAZER KRAIT

CARL
Super-sensitive gaming design for a great price.

LENNY
Only three buttons; on-the-fly sensitivity doesn't work well.

8

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Mini Media Players

Good ideas in very small packages

When it comes to digital media players, it seems as though Apple's Steve Jobs can command attention for his iPod line just by passing gas. That's unfortunate, because there's a tremendous amount of innovation going on at other manufacturers. Here's a look at two examples.

—MICHAEL BROWN

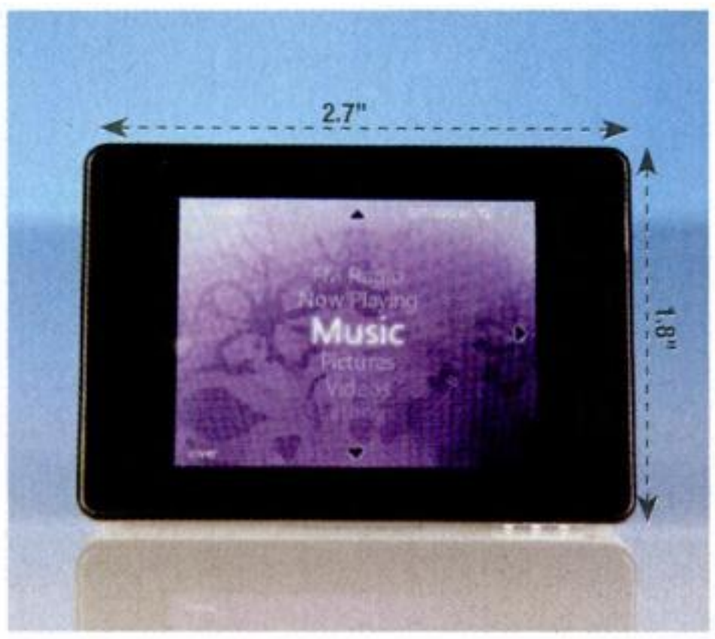
IRIVER CLIX

We hereby decree that every new media player should henceforth be equipped with an instant-on feature, like that of iRiver's Clix. You push the power button and—*bam!*—the Clix is up and running.

As PC users, we've all grown accustomed to electronic devices taking a few seconds to start up—the Sansa e260 (also reviewed here) takes 15 seconds. But we'd never tolerate a home-entertainment system that took so long to do its job; why should media players be any different? Other innovations in the Clix include support for Macromedia Flash games and a built-in alarm clock.

We're much less enthused with the Clix's too-clever control mechanism: The user interface is easy enough to understand, but you navigate it by squeezing the four edges of the screen. These incognito buttons lend visual flair to the player's design, but they also render it nearly impossible to operate with one hand.

The Clix sounds great, and its 2.2-inch color display delivers spectacular image quality even when viewed off axis. The player supports Microsoft's Plays For Sure music, so it's compatible with a wide variety of subscription music services, but iRiver recommends you use Microsoft's clunky *Windows Media Player* to load music into the player's 2GB of storage. Use it to upload your meticulously ripped MP3s, and it will first unnecessarily convert them to WMA format. (We recommend using Windows Explorer, instead). iRiver doesn't provide any video-conversion software, either; you'll need to download the freeware *iRiviter* for that.



The Clix is drop-dead sexy; it's a shame it'll wind up in a landfill when its non-replaceable Li-Ion battery eventually dies.

IRIVER CLIX

THE RIVER NILE
Innovative instant-on feature; great audio and video performance.

THE RIVER STYX
Awkward to use with one hand; no conversion/transfer software.

7

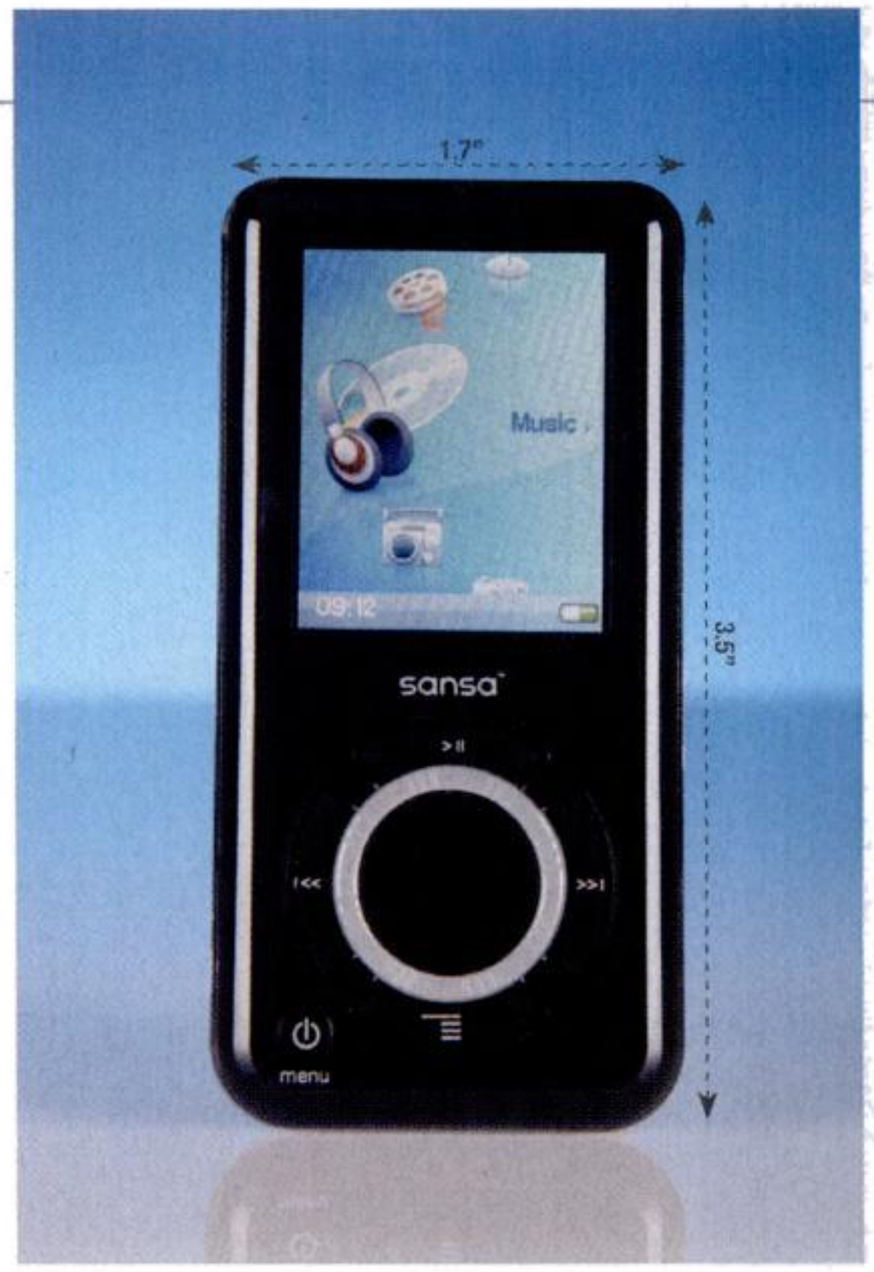
$200, www.iriver.com

SANDISK SANSA E260

The Sansa e260 has several features we'd love to see in other media players, including a microSD card slot; unfortunately, it's also saddled with a killer design flaw.

Audio sounds marvelous on the e260, and videos and photos look fabulous on its 1.8-inch TFT display. It's much better looking than Creative's OLED-equipped Zen V Plus, which we reviewed in October, but you still need a magnifying glass to see detail.

The bundled *Sansa Media Converter* software makes short work of translating photo and video formats and then transferring them from your PC to the player's 4GB of flash memory, but you'll want to spend some time cropping and resizing your photos beforehand, to take advantage of every inch of screen space. Music transfers are accomplished using either *Windows Media Player 10*, Windows Explorer, or—if you subscribe to a Plays For Sure music service—that provider's own program.



We'd like SanDisk's Sansa e260 a whole lot more if we could disable its %#@! Record button.

The e260's user interface is very intuitive, and its primary control mechanism (a raised and illuminated wheel with a large button in its center) is easy to manipulate with one hand. But we had difficulty with the less frequently used playback control buttons; they're set at four compass points around the wheel, but they're too small and too close to the wheel for big thumbs to operate comfortably.

The imperfection that nearly renders the e260 useless, however, is the size, location, and sensitivity of its Record button: It's much too big, it's way too sensitive, and it's located right where you grasp the device. We unintentionally activated voice recording countless times during product testing, and the only way you can lock the button is to lock *all* the buttons. Lame!

SANDISK SANSA E260

SAND IN YOUR BUCKET
Looks and sounds great; plenty of storage, plus a microSD slot.

SAND IN YOUR SHORTS
The poorly placed Record button will drive you nuts.

5

$230, www.sandisk.com

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ADVERTISEMENT

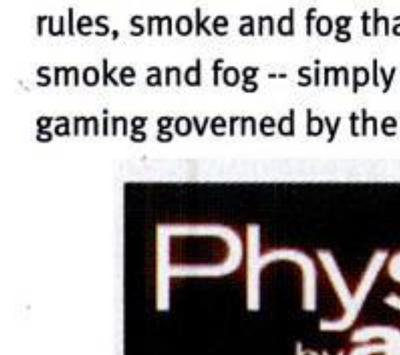
The Mathematics of Kick-Ass: AGEIA PhysX™

To all gamers who have experienced tears of joy launching a grenade into an oil tanker, you know the flipside disappointment of having to watch identical explosion dynamics as the game progresses in what amounts to the wreaking of some very scripted havoc.

Enter the AGEIA PhysX Processor: the first hardware accelerator for PC games dedicated to enabling real-world environmental interaction. What does this mean? Big, juicy explosions with dust and debris, weapons that follow their own rules, smoke and fog that actually behave like smoke and fog -- simply put, a new generation of gaming governed by the laws of physics.

How Does It Work?

The AGEIA PhysX Processor is a PhysX Processing Unit (PPU) which works in tandem with your CPU and Graphics Processing Unit (GPU). Each processor is responsible for different aspects of gameplay: The CPU controls artificial intelligence, the GPU renders and displays graphics, and the PPU processes movement and physical interaction. Ageia refers to the three processors as the "Gaming Power Triangle." For gaming enthusiasts it might as well be called the Holy Trinity.



What Games Take Advantage of PhysX?

There are currently over 60 publishers and developers using AGEIA PhysX in over 100 titles. Some of the heavy hitters? The uber-popular Tom Clancy's Ghost Recon Advanced Warfighter as well as Rise of Nations: Rise of Legends. You're also likely soon to see mainstays like Unreal Tournament 2007 and Warhammer Online.

with PhysX | without PhysX

Getting Started

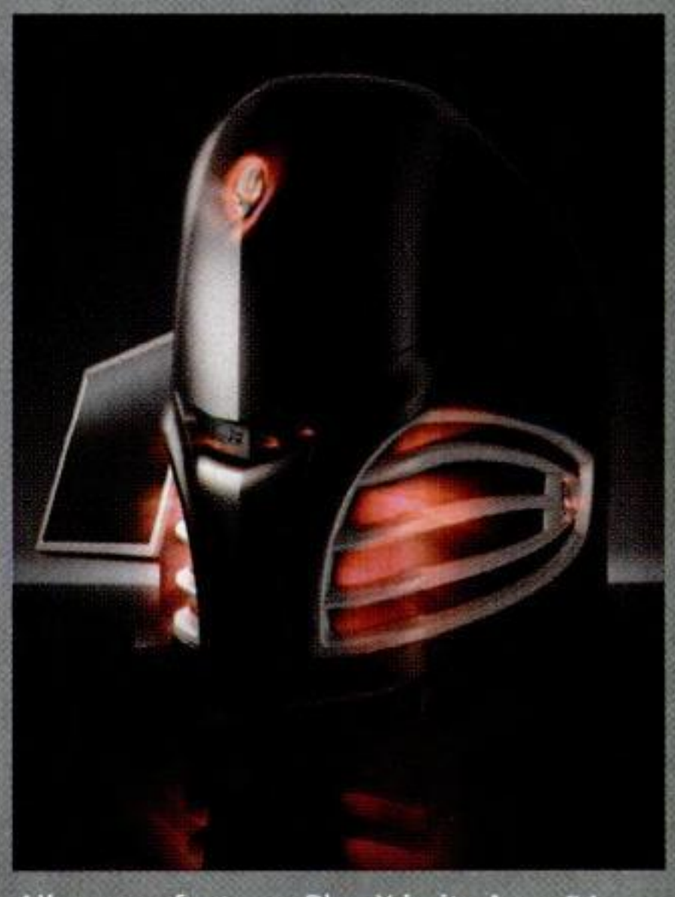
Getting started isn't quite as easy as dropping a PhysX card into your empty PCI slot. First, you will need as much graphics firepower as you can muster to keep up with the thousands of potential objects that a PhysX processor can spawn. For instance, debris, shrapnel and assorted odds and ends generated from an explosion may not simply disappear from the game. They can continue to exist as independent environmental objects and your GPU will need to track and monitor each as they are all potential points of future interaction. This being said, the relationship between the GPU and PPU is symbiotic: The PPU relieves the GPU of some of the burden of physics processing allowing it to focus solely on the render and display of graphics.

Final Word

Are you an early adopter? Go PhysX. Do you want to immerse yourself in next generation gaming now? Go PhysX. Are you a tad GPU-deficient? First invest in hardware that will allow PhysX to shine, like a SLI-equipped gaming desktop.

Alienware features PhysX technology in its high-performance Area-51, Aurora 7500 and ALX desktop product lines.

Area-51® 7500



Alienware features PhysX in its Area-51, Aurora 7500 and ALX desktops.

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www.alienware.com/awadvisor

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One Key to Rule Them All

Four flashy keys show us what they're made of

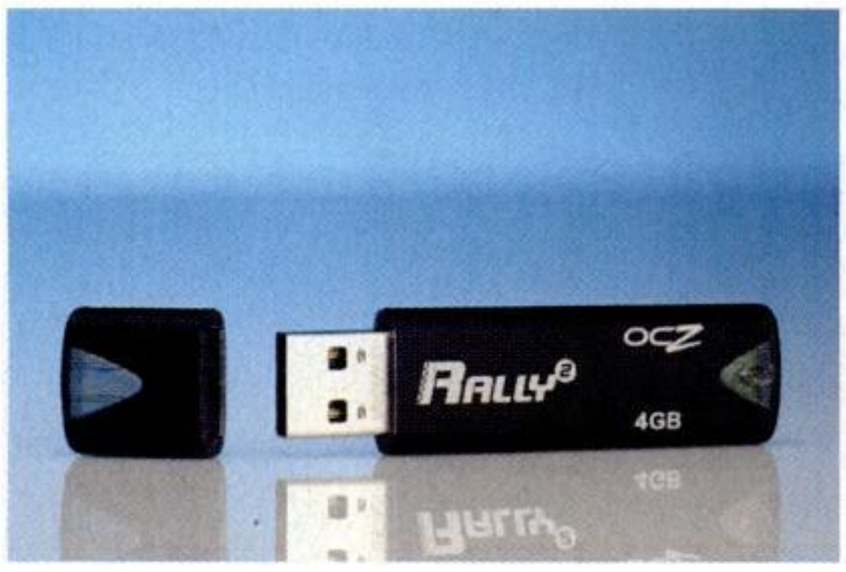
USB keys have been around for years now, but they continue to evolve. Today's keys can be divided into two distinct camps—those that come with software and those that don't. For a lot of people, software is totally unnecessary on a USB key, but for others (read: people who move from PC to PC), it's a godsend. This month we have rounded up keys of both persuasions and put them through their paces in our Lab. One thing is certain: Given how cheap USB keys are nowadays, no geek can afford to be without one.

—JOSH NOREM

Talk about a perfect blend of sass and class: SanDisk's Cruzer Titanium looks fantastic, and performs even better.

OCZ RALLY 2 4GB

After receiving several reader requests to check out the Rally 2 key from OCZ Technology, we were persuaded to call one in. As it turns out, the Rally 2 is a darn sexy flash drive. It's devoid of any software, which doesn't surprise us: OCZ has always stood for "performance first," thus it makes sense that the Rally 2 is designed for one thing and one thing only—fast data transfers. Granted, it's not as fast as the SanDisk key (reviewed next), but it offers double the capacity at the same price point, making it a mighty compelling alternative.



OCZ's Rally 2 looks fast just sitting still. And it is fast, but not as fast as SanDisk's Cruzer.

OCZ labels the Rally 2 a "dual channel" drive, meaning it's able to read and write data from two channels of memory at the same time, sort of like a striped RAID array. OCZ also claims that this 4GB key is optimized for large file transfers—5MB or larger. This certainly seems to be the case, because the Rally drive absolutely choked on an assortment of *Word* documents that we use in our file transfer test, but it breezed through the larger test files. Of the four keys reviewed here, it was the second-fastest in both read and write tests.

Its aluminum chassis is sleek and seems quite durable. The top of the key sports a small hole that's intended for use with the included lanyard—it's too small to be used with a keychain, unfortunately.

SANDISK CRUZER TITANIUM 2GB

Look at this sexy mofo. Talk about elegant and sophisticated! And we love how its cap-less design addresses one of our biggest complaints with these drives—the caps always get lost! On this key, you push the USB header out of the key when you need it, and slide it back in when you're done. This not only reduces the key's size considerably, but it protects the port as well. It's a perfect design, in our opinion.

Unlike the other keys in this roundup, the Cruzer comes with the increasingly popular U3 technology, which is like a mini-OS for the key. When the key is plugged into your PC, you can access a "start menu" from the system tray. You can run programs right off the key, add new programs, manage them, and so forth. Though we dismissed U3 as being largely worthless when we first encountered it, we're impressed with the Cruzer's implementation of the technology. A streamlined loading process addresses the problem we had in the past: waiting on a lengthy splash screen before we could get at the key's contents; here you can access the key instantly, and the U3 stuff loads quietly in the background. And SanDisk includes some truly useful programs, such as antivirus and synching apps.

The icing on the cake is that this key is hella fast. It smoked every other key in this roundup in our read/write tests, making it a jack-of-all-trades device. You can even password-protect its contents. It's pricey, but not outrageously so, and it delivers enough extra juice to justify the cost.

OCZ RALLY 2

WHISKEY
Very fast read/writes, sleek design, and slim chassis.

HOUSE KEY
No software bundle; not as fast as SanDisk's key.

8

$130, www.ocztechnology.com

SANDISK CRUZER TITANIUM

HARD DISK
Very fast read/write, incredibly small and slim, and great U3 software.

SLIPPED DISK
A bit pricey for its capacity.

9

MAXIMUM PC KICKASS

$120, www.sandisk.com

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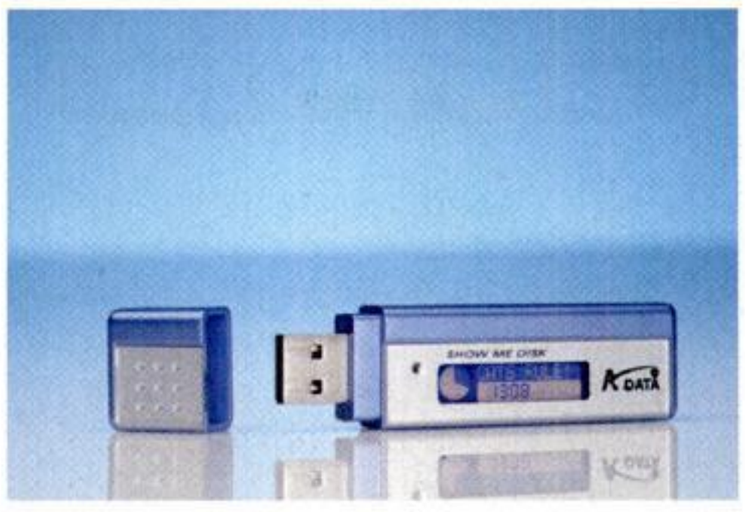
Yes, the My Flash Fingerprint drive is what you think it is. You swipe your finger over a small scanner to unlock the key's contents. It works perfectly, too.



The 11-digit readout on A-Data's Show Me Disk can be programmed to display whatever you want, and no batteries are required to keep it lit, either.

A-DATA MY FLASH FINGERPRINT DISK 2GB

The My Flash Fingerprint Disk offers a feature that goes well with a USB key: a fingerprint scanner to protect the drive's contents. While not everyone keeps satellite images of nuclear facilities and top-secret documents on their USB key, it's still reassuring to know that there's an extra level of protection between your data and potential do-badders.

The fingerprint-recording process is as simple as can be. You select a finger from either hand to train onscreen, then swipe the chosen digit over the scanner. It records your fingerprint and you're set—every time you plug in the key you have to swipe that finger to unlock the drive's contents. Otherwise, the key's contents are invisible, and the drive is write-protected. If you want to add another fingerprint to the key's database, you have to first swipe the original finger in order to proceed.

While the fingerprint mechanism works fabulously, the key performed poorly in our file transfer tests. This seems to be a trend—no-name keys are usually slower than their brand-name brethren. In the end, this key's svelte formfactor and biometrics can't make up for its pokiness.

A-DATA SHOW ME DISK 2GB

Now *this* is cool. the Show Me Disk includes an 11-character readout that displays any name you create for your key. Whatever you you type into Windows Explorer shows up on the key's display, so people will know its "Josh's key," or they'll see that "Cats rule," maybe. The display also features a pie chart and numerical rating for the available capacity, which is wicked-awesome. You just glance at the pie or the number to find out how much space you have left. We love these features! There's one tiny problem: This key is slow as molasses in a New York winter. It's so slow we grew a beard transferring 1GB of data to the device. We then had ample time to shave said beard reading that 1GB of data from the key.

Aside from the cool display, this key doesn't boast much else. It's very affordable for a 2GB key, but we don't like its blocky, cheap-looking plastic body. And it's too fat; it can't be plugged into a USB port if there's another device plugged above it, although it fits just fine if the port below it is occupied.

There's no software bundle, but we wouldn't expect that on a $50 key. The snazzy display is really this key's only selling point.

A-DATA MY FLASH FINGERPRINT DISK

FINGER PAINT
Great security feature, easy-to-use scanner, and affordable.

FINGERPRINT
It's a one-trick pony, and it's slow.

7

$52, www.adatausa.com

A-DATA SHOW ME DISK

APPLE PIE
We love the display; somewhat affordable.

PIE CHART
A bit too portly, lacks software, and is agonizingly slow.

6

$52, www.adatausa.com

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MP3 SPEAKER

Klipsch iGroove HG

Klipsch's iGroove HG has no Dock connector, so it won't sync your iPod to *iTunes*. It has no video output, so it won't connect your iPod to your TV. It has no LCD, so you'll have to rely on your iPod to see which track is playing. But this powered speaker has one redeeming virtue: It rocks!

Klipsch remembered what so many other media-player speaker-system manufacturers have forgotten: A powered speaker's most crucial mission is to amplify and project high-quality audio. Every other feature—be it data transfer, *iTunes* synching, video output, portability, or a fancy display—pales in significance.

The iGroove passed our punishing bass test (Paul Thorn's "Fabio and Liberace") with aplomb, delivering punchy lows without distortion, rattles, or other unpleasant side effects. It sounded damn fine with a variety of other sonic material, too, offering exceptional frequency response and superb stereo separation. And the amp has plenty of power on tap—this puppy gets *loud*.

Power and volume are the iGroove's only front-panel controls; and the remote offers only power, volume, play/pause, and track forward/back buttons—you must rely on the iPod for everything else. But unlike all too many other docking stations, which leave the iPod flopping around like a dying flounder whenever you push its scroll wheel, the iGroove hugs the player in a tight embrace. Don't have an iPod? Plug in Klipsch's brilliant J-Dock and you can enjoy the iGroove with nearly any media player (although the fit won't be as secure).

Sorry, Klipsch. You won't be getting your iGroove back for a while—it's just become our new reference platform.

—MICHAEL BROWN

KLIPSCH IGROOVE HG **9**

$250, www.klipsch.com

MAXIMUM PC KICKASS

MP3 SPEAKER

JBL On Tour Plus

The JBL On Tour Plus does a great job reproducing vocals, guitar, snare drum, and other moderate- to high-pitched instruments. But this wee powered speaker system has absolutely no bass response.

This ingeniously designed little box is supremely portable, measuring 7inches wide and just 3.5 inches deep when closed; sliding the cover open to expose the speakers increases its depth by less than 3 inches. It weighs just 13 ounces, runs on either four AAA batteries or the included AC power adapter, and comes with a well-appointed hard-shell carrying case.

The "Plus" is a detachable bracket that will hold a Sony PSP securely; but we found it capable of propping up just about any player, including Apple's iPod and Creative's Zen Vision: M. You can even adjust the bracket to obtain the best viewing angle.

A miniature Class D amplifier delivers three watts to both of the 1.5-inch aluminum-domed transducers, which are driven by neodymium magnets. The speakers sound smashing with spare, vocal-centric recordings, including Leonard Cohen's resonant baritone on "Hallelujah" and Tori Amos' heart-rending soprano on her cover of The Rolling Stones' "Angie." But as it struggled to deliver Beck's synth-and-bass-heavy "Nicotine and Gravy," the teensy device conjured auditory memories of the bleeps and bloops of Mattel's Intellivision.

And then there's the price tag to consider: A $130 media-player speaker that can't convey bass and doesn't dock, sync, or recharge an iPod tickles our spleen-venting reflex; but we won't slam it because it sounds so good with some types of recordings, it boasts supermodel good looks, and we dig that dandy player cradle.

—MICHAEL BROWN

JBL ON TOUR PLUS **6**

$130, www.jbl.com

MP3 SPEAKER

Logic3 iStation 8

The iStation 8 has almost everything you could want in an iPod speaker system: It docks, syncs, and recharges your iPod; it has composite and S-Video outputs, a headphone output, and an auxiliary input; it's portable; it comes with a remote control; and it even boasts a 16-character LCD display. Its designers neglected just one aspect: great sound.

In our mind's eye, we see them excitedly leafing through a Chinese component-manufacturer's catalog: "Wow, everything's so *cheap*! We can put *eight* drivers in the box, and an absolutely *huge* woofer."

Sure you can. But when critics like us audition systems like this, we just can't muster the same enthusiasm. To be fair, the iStation 8 sounds only mediocre, not outright terrible; and it's a bargain for all that it delivers. But bargains usually entail compromises, and this compromise impacts the product's core mission: audio.

Four 1.26-inch neodymium drivers are stacked on each side of the enclosure, with a single 2.5-inch woofer in the middle. An amplifier squirts four watts per channel to the full-range speakers—one watt to each driver—and 12 watts to the woofer. The system produces acceptable highs, but slightly muffled and ill-defined mids and lows. Put them together and you get an unexciting musical experience; closer to listless than utterly lifeless, but boring all the same.

We've criticized many an iPod docking port for not providing adequate support for the player, and we level the same charge at this one. The iStation 8's blue LCD, on the other hand, cranks up the hip factor with a feature we've never seen before: Song titles plucked straight from a docked iPod!

—MICHAEL BROWN

LOGIC3 ISTATION 8 **7**

$180, www.logic3.com

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The Top 8 Reasons Your Computer Can't Wait For PerfectDisk 8

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7. To ensure your drive is always in shape, new AutoPilot Scheduling™ lets you set your computer to defrag automatically. What's more, unlike the competition, new *intelligent* Screen Saver Mode automatically defragments idle computers if a user-defined number of days have passed since the last defrag.

6. PerfectDisk's new patent-pending Resource Saver™ technology finds all the fragments of a file without first opening the file, efficiently defragmenting even the largest of drives with minimal system impact.

5. PerfectDisk's Space Restoration Technology,™ with its Consolidate Free Space Defrag, lets you create the largest piece of contiguous free space available prior to creating large files or performing partition resizing operations.

4. No competing product even comes close. PerfectDisk is Microsoft-certified, more effective and far easier to use than the built-in defragger. And unlike certain competitor's "solutions," PerfectDisk doesn't charge you more just because you drive a really big drive.

3. With new Single File Defrag, you can specify a single file to defragment, rather than the entire drive. This is particularly useful for those of you working with the largest of today's supersize files.

2. PerfectDisk's new I/O and CPU throttling features automatically detect when a system is "busy" and reduces its disk I/O or CPU usage accordingly, making the defragmentation of even the busiest drives practical.

1. And best of all, PerfectDisk 8 defragments, optimizes and consolidates even the largest drives in a single pass. Done. And with our Competitive Trade-up Program, the time is great to migrate to 8. So why wait? Download a FREE trial at www.perfectdisk8.com.

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Photo Finale

Underachieving and apparently proud of it

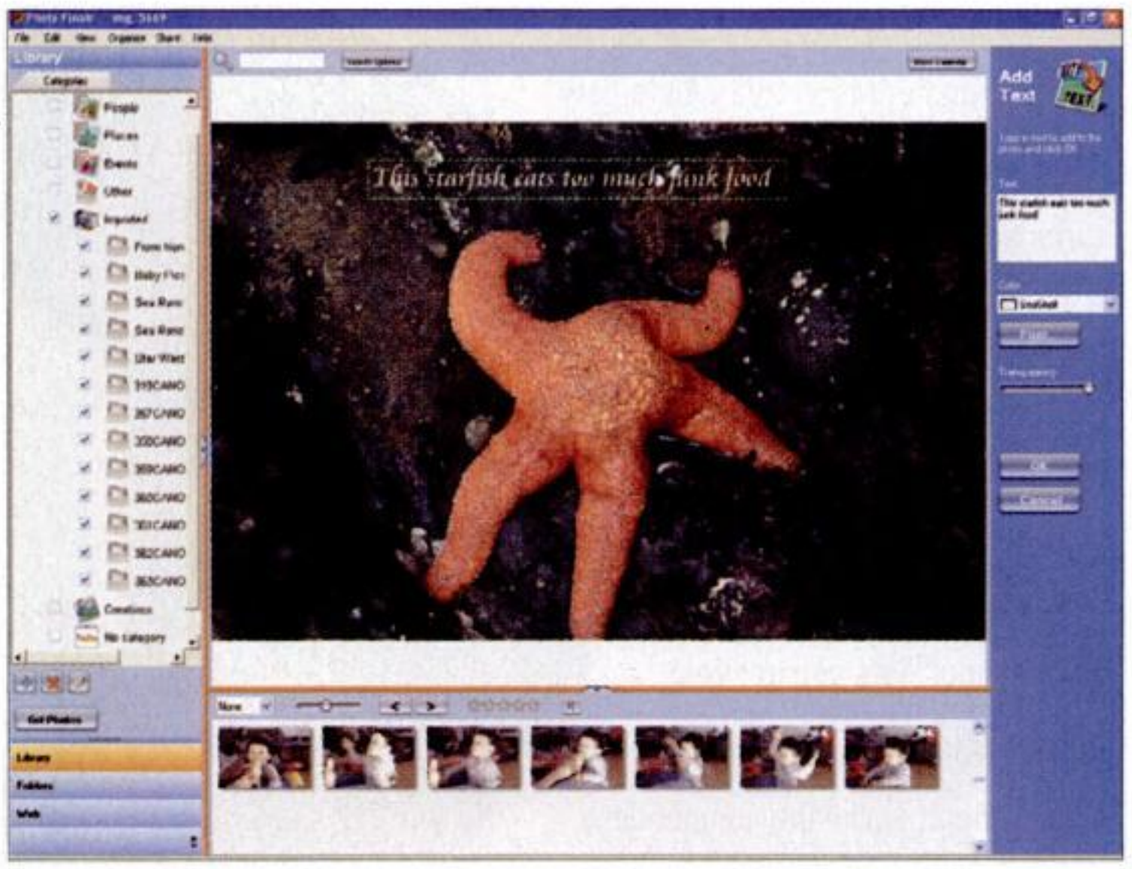

***Photo Finale* falls down but it probably doesn't care.**

Remember when your high school counselor asked you about your life goals? Remember when you told her that you just wanted to finish high school? Remember when she sighed and told you to set your goals a little higher? The folks at Trevoli should do the same thing with *Photo Finale*.

***Photo Finale* should compete with the digital-imaging set—you know, *Firegraphic* and *Photoshop Album*—but it seems to only aspire to smoking weed, hanging with the fellas behind the 7-Eleven, and grooving to the new AC/DC album. Maybe, just maybe, it will one day be accepted alongside photo-management apps that are given away for *free*.**

***Photo Finale* just feels uninspired to us—almost listless. Sure, Trevoli pushes it as an "easy" way to get photos from your camera, organize them, and even make CD or DVD slide shows from your pics. But most digicams come bundled with software that handles those simple tasks. And *Photo Finale's* image-tweaking features are along the lines of cropping and red-eye removal—nothing more complex than that. The slide show titling tool is so frustrating to use that we want to expunge the software from our system permanently, and the limited clip art selection seems like it was lifted from a CD-ROM circa 1995.**

To be fair to *Photo Finale,* plenty of other programs are technically in this slacker category, including Google's *Picasa*. But *Picasa* is free. And *Picasa* is at least able to process RAW photo files, something you can't do with *Photo Finale*.

Not everything about the app is negative. We actually like *Photo Finale's* ability to sort photos by the camera's exposure setting—if nothing you've shot looks sharp, it probably means your technique is weak.

But this does little to chip away at *Photo Finale's* flaws—the biggest of which is its lackluster performance. On a dual-core Athlon 64 FX-60 with 2GB of RAM and a 400GB hard drive, the app just chugs. The program takes roughly two seconds to move from image to image. XP does the same thing in half a second. Indeed, there are just too many negatives in *Photo Finale's* column to recommend it.

—GORDON MAH UNG

PHOTO FINALE **3**

$50, www.trevoli.com

MemoriesOnTV Pro 3.0

Our favorite slide show producer gets better

You can now combine several images to create a single, multi-image slide that moves in *MemoriesOnTV Pro.*

Garage developers have coded some of the most amazing software available today—including *MemoriesOnTV Pro.* Version 3.0 of Codejam's powerful slide show maker packs in a ton of new features and improvements yet maintains the friendly design that we've long loved about the app.

The niftiest new feature is the ability to combine multiple images into a single frame of your slide show. But as much as we like the output, we're not thrilled with the implementation—Codejam cheats when rendering the multi-image effect. While all the other effects in the program run in real time, the multi-slide effect comes about after first being rendered to a video file, and then inserted into the timeline. Fortunately, the render only takes 10-20 seconds, and making changes is fairly easy as well, but it feels like a hack.

The strength of *MemoriesOnTV* has always been its ability to emulate Ken Burns' trademark zoom, pan, and fade style. *MemoriesOnTV* remains the best tool for Burns wannabes, and it's damned easy to use.

The biggest improvement over previous versions of the software is *MOTV 3.0's* stronger audio-editing chops. The program will now automatically trim out the silence at the end or beginning of your soundtrack. And long overdue is the ability to add sounds to individual slides. That's handy for narrating your slide show. *MemoriesOnTV* gives you the ability to fade out the music while the narration plays, as well as the ability to set the narration volume. We appreciate the additions, but we still wish you could view and edit footage in a more traditional timeline—something you see in most video applications.

And that's the rub. *MemoriesOnTV* is really nothing more than a tool to create slide shows; it's not a replacement for a nonlinear video editor. With cheap video editors and DVD burning bundles offering similar functionality today, albeit not nearly as polished or easy to use, you have to be really serious about picture DVDs to opt for *MemoriesOnTV*. We obviously are, and for slide shows, *MemoriesOnTV* is the first icon we click.

—GORDON MAH UNG

MEMORIESONTV PRO 3.0 **9**

$80, www.codejam.com

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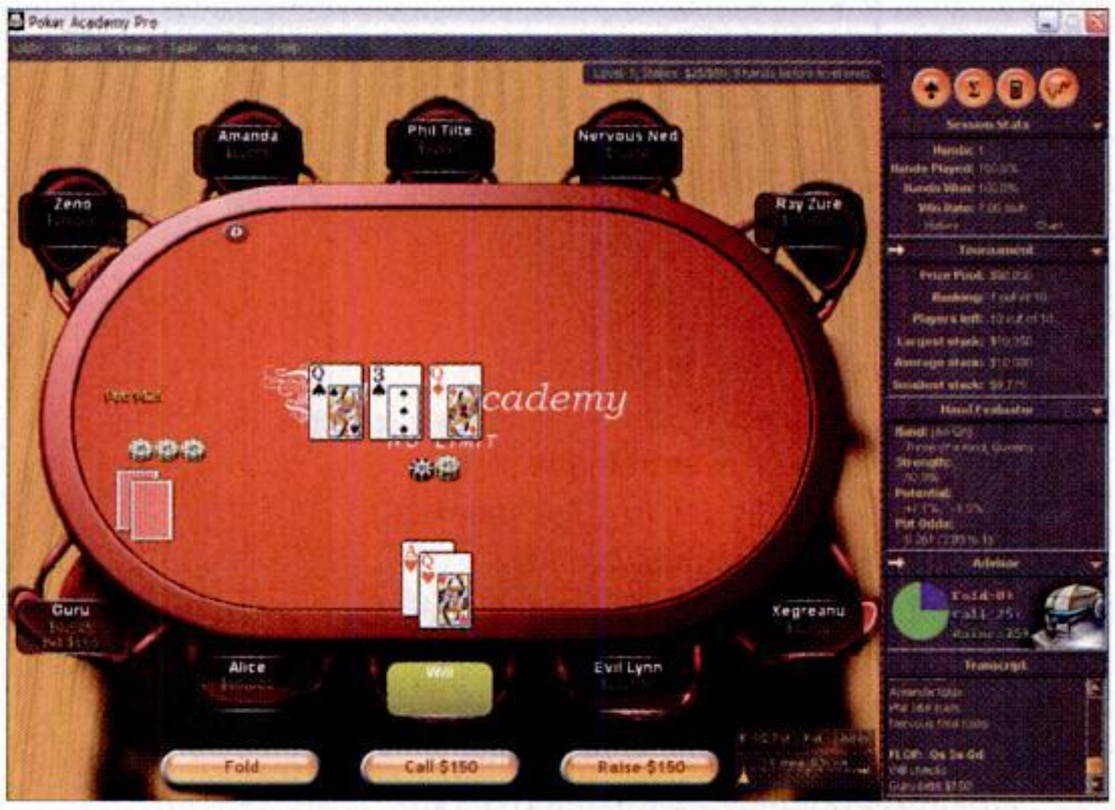
Poker Academy Pro 2.5

A good place to practice, a good place to learn



If you're looking for a way to play more practice hands in Texas Hold'em, but don't want to risk your bankroll, try *Poker Academy Pro.*

We love playing poker, but we're not so keen on online gambling sites of dubious legality. We're equally wary of "play money" sites, where people play so loose and fast that you quickly develop terrible habits. If you take your newb game to a local card room, you'll most likely walk out with a much lighter wallet. Indeed, it's tough to find a good place to practice your Texas Hold'em game.

That's where *Poker Academy Pro 2.5* comes in. With hyper-advanced computer opponents, *Poker Academy Pro* gives you a place to hone your strategies that won't cost you a cent, beyond the price of the game. You can test new maneuvers, tweak your play style, and perfect your tournament techniques without risking your bankroll.

***PA Pro* includes the most realistic, convincing bots we've played against. The game uses several "dumb" situational bots, which follow a fixed set of rules, as well as learning bots, which study your play style and adjust their strategies to take advantage of your weaknesses. The upshot is that *PA Pro* will challenge you more the more you play, and you'll face a good mix of competent, crazy, and skilled players every time you load a table or tournament. Over time, you'll learn how to exploit the bots' strategies at the same time they adapt to yours. By pitting you against several different types of bots with a wide variety of strategies and skill levels, *PA Pro* succeeds where many other poker games fail. You can actually pick up skills and improve your game playing against these opponents.**

Once you feel confident in your game, you can go online and play against other *Poker Academy* owners. While we don't typically encourage playing for virtual money, because of the bad habits and loose calls it encourages, we make an exception for *PA* online. Because the people playing had to spend real cash to access the service, they're playing to learn and to improve their real-world game (for the most part). In order to participate in the serious tournaments and ring games, you've got to buy in using Poker Academy Credits (PAX). The only way to get PAX is to finish in the money in one of the frequent "freeroll" no-limit tournaments. By using the PAX system, you can practice building and protecting your poker bankroll, just as you would with real cash.

But wait, there's more! *PA Pro* keeps a detailed history of every hand you (and your opponents) play. With complete details—including winners, losers, bets, raises, folds, and the cards you see. In addition to tracking your bankroll and win/loss record over a long period of time, the app also analyzes your play, making it easy for you to tell if your actions line up with your intended strategy.

—WILL SMITH

POKER ACADEMY PRO 2.5

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YOU'RE NUTS

Expensive; some bots are easily gamed.

9

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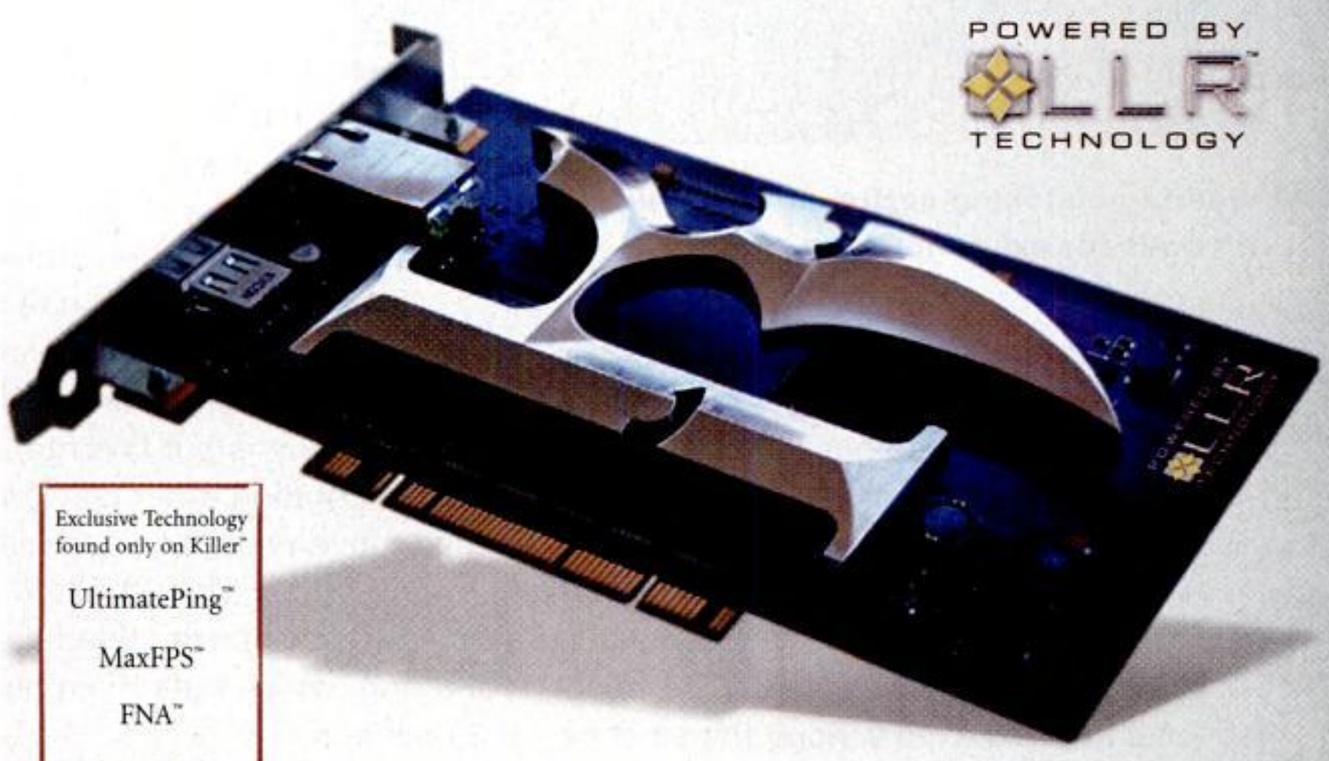

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The Ship

Murder the way it should be—classy and with umbrellas

Like J. Lo in her 2002 movie, this stalkee has had *Enough*.

Finally, here's a fresh first-person shooter that doesn't rely on twitchy trigger fingers or overdramatic stealth sequences. *The Ship* trades in quick reflexes and steady aim for an emphasis on sly cunning and novel intrigue. Originally developed as a *Half-Life* mod, this UK-produced multiplayer game has been remade on the Source engine and released at retail and over Steam as another indie-dev-goes-commercial success story.

The Ship invites players to embark on one of six multiplayer cruises, courtesy of a mysterious Mr. X. Once onboard an online server, you begin a truly innovative cat and mouse game, where you must hunt down an assigned target for cash. The genius in the design is that you have to eliminate your mark without getting caught—by either security cameras or nosy observers. While you're trying to eliminate your mark, someone else is trying to eliminate you. Because the vessel is occupied by both NPCs and real players, we found that a great tactic is to mimic NPC movements while stalking targets, until they take required bathroom and meal breaks. Then we make our move.

Wearing matching outfits on *The Ship* is apparently grounds for execution.

This new style of gameplay creates high tension anytime you're in an unpopulated area of the ship, and a sense of amusing role-playing as you partake in the various social activities aboard the ships. We found it helpful to explore the various ships before moving online, as each features a unique layout and tons of hidden goodies. Picking up a hefty axe off the wall or butcher knife from the kitchen is OK in a pinch, but the best weapons are secreted away in stateroom cabinets and behind hidden passageways. Not only will you want to learn where the weapons are concealed, you'll also need to learn the location of new outfits, which you can change into to throw your stalker off your scent.

You'll also dig the delightful art deco aesthetic of the different ships and characters, which is a throwback to the lavish lifestyle of 1920s flappers. The developers take full advantage of the diverse color palette accommodated by the Source engine, and litter the maps with subtle nuances to enhance the stylistic atmosphere. We found ourselves wandering into rooms just to listen to speakeasy tunes on the radio. Too bad these fanciful strolls frequently ended with our beheading!

Even if you're killed, there's plenty for you to do while you wait for the next round. After we find an ideal weapon (the flare gun is our favorite), we usually try to sabotage other players by tracking their movements and catching them in the act of murder. Players caught with unconcealed weapons are fined and thrown in the brig, which puts them out of play for 30 seconds.

There are two game modes: the Hunt and Elimination. In the Hunt players are ranked by how much money they've made killing opponents. In Elimination, you're assigned one player to kill; after you succeed, you inherit your victim's target, and so on. The intensity ramps up as players vie to be the last passenger afloat.

We encountered some animation glitches while playing the game—models sliding around corridors in sleeping or sitting positions. Other players online have reported this bug, as well, but we couldn't replicate it on other test machines. We also felt that the needs system—which controls when you need to eat, rest, and go to the bathroom—could use some tweaking. It's annoying to have to eat, sleep, and excrete every five minutes while you're on the prowl. And as with all multiplayer games, *The Ship* plays best with packed servers and gamers who play by the rules—the single-player mode is outright boring. For $20, *The Ship* is a worthwhile diversion—we just hope the dev team decides to release new maps in the future. All aboard!

—NORMAN CHAN

THE SHIP

+ QUEEN MARY 2
Innovative and nail-biting gameplay with delightful art style.

− TITANIC
Animation bugs and balancing follies mar the admirable effort.

7

$20, www.theshiponline.com

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CivCity Rome

Nothing better than throwing a good brand-name around

There's a lot going on when a city grows to this size—too bad 1280x1024 is the highest supported resolution.

This game might contain that all-powerful three-letter "Civ" moniker in its title, but make no mistake: There's almost nothing *Civ*-like about this game. *CC Rome* lacks the depth of the *Civilization* series of empire-building games. In fact, it lacks the depth of even *SimCity 4* and Impression's *Caesar III*, which remains the finest Roman city builder you can play, although it's eight years old (an update, *Caesar IV*, is due this fall).

So, aside from a shameless attempt to leverage one of the PC's most recognized brands, what does *CC Rome* offer? We'd like to say it brings cutting-edge 3D graphics to the table—its setup menu would like you to believe it does, sporting such buzzwords as "bloom, real-time shadows, multipass shaders, bump mapping, and enhanced water." It certainly runs slowly enough on a high-end PC to make you believe it's cutting-edge. However, with a maximum resolution of 1280x1024, the game really does little to impress the eyes. (And a graphics bug appears at any resolution above 1024x768, making it nearly impossible to select anything with the cursor. A patch is forthcoming.)

The enemy managed to "sneak" right past our troops and raze our city without being attacked—until we stepped in, that is.

It might not be beautiful, but *CC Rome* does sport a truly impressive level of animation. Cities feel alive with hustle and bustle, and if you zoom in on any structure, you'll likely be surprised with what you see: children playing in the streets and gardens, gladiators fighting to the death in arenas, chariot races taking place at the circus, citizens exercising in their homes, mills grinding wheat into flour, workers harvesting crops and loading and unloading ships at the docks, merchants ferrying goods to their stores, etc.

Fortunately, *CC Rome* does just enough to be addictive. It's the kind of game that could have you burning the midnight oil, often—the one element it has in common with *Civilization*. There's a wide variety of buildings and upgrades that not only give your cities visual diversity, but will also have the civic planner in you scratching your head to figure out exactly the best way to keep the citizenry happy. Do you have ample goat farms to provide your city with meat? Is it time to start a goose farm to satisfy the more sophisticated palette of your (hopefully) growing upper-class populace? Do you produce enough grapes to make wine, wheat to make bread, olives to make oil, and flax to make cloth? Get the proportions right and your city will blossom, which is great fun to see. Be prepared for lots of trial-and-error discovery, though: The game's built-in tutorial and manual do little to actually help you learn how to play.

The single-player campaign is a mixed bag. It lets you choose between missions with either military or peaceful goals, which is a good thing. The military missions are ludicrously dumbed-down. Other than forming armies and telling them where to go on the map, you have very little control over their actions. And the AI has some issues—your armies will stand by and watch an enemy ransack your city unless you actually tell it to attack the enemy. Thankfully, the peaceful missions make up for the military deficiency with a variety of options and an alluring sandbox feel.

We would have liked to see a bit more depth to the game, such as the ability to set taxation levels ourselves (instead they're automatically tied to city growth), and perhaps set prices on the costs of goods both in city commerce and in trades with neighboring cities. And built-in city advisors, similar to the ones in *Civilization IV*, would be welcome as well.

As it stands, *CC Rome* manages to be fun despite its limitations, but it just doesn't bring enough innovation to the table to recommend it highly.

—STEVE KLETT

CIVCITY ROME

TOGA PARTY

Tons of animation, nice diversity of buildings to place and upgrade, interesting campaign.

TUPPERWARE PARTY

Not much to look at, overly simplistic, bugs, and AI issues.

6

$40, www.2kgames.com/civcityrome/civcity.html, ESRB: E10+

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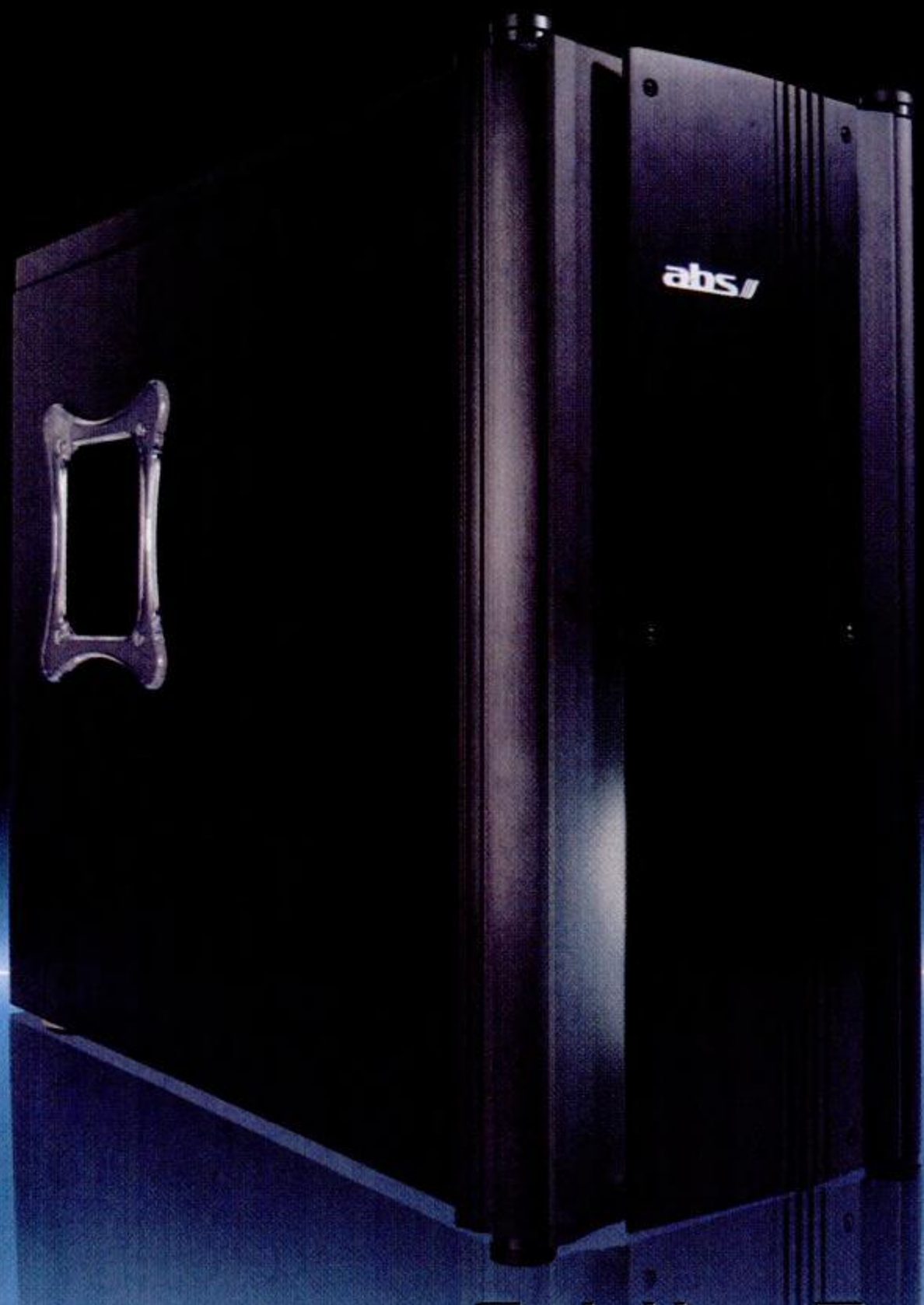

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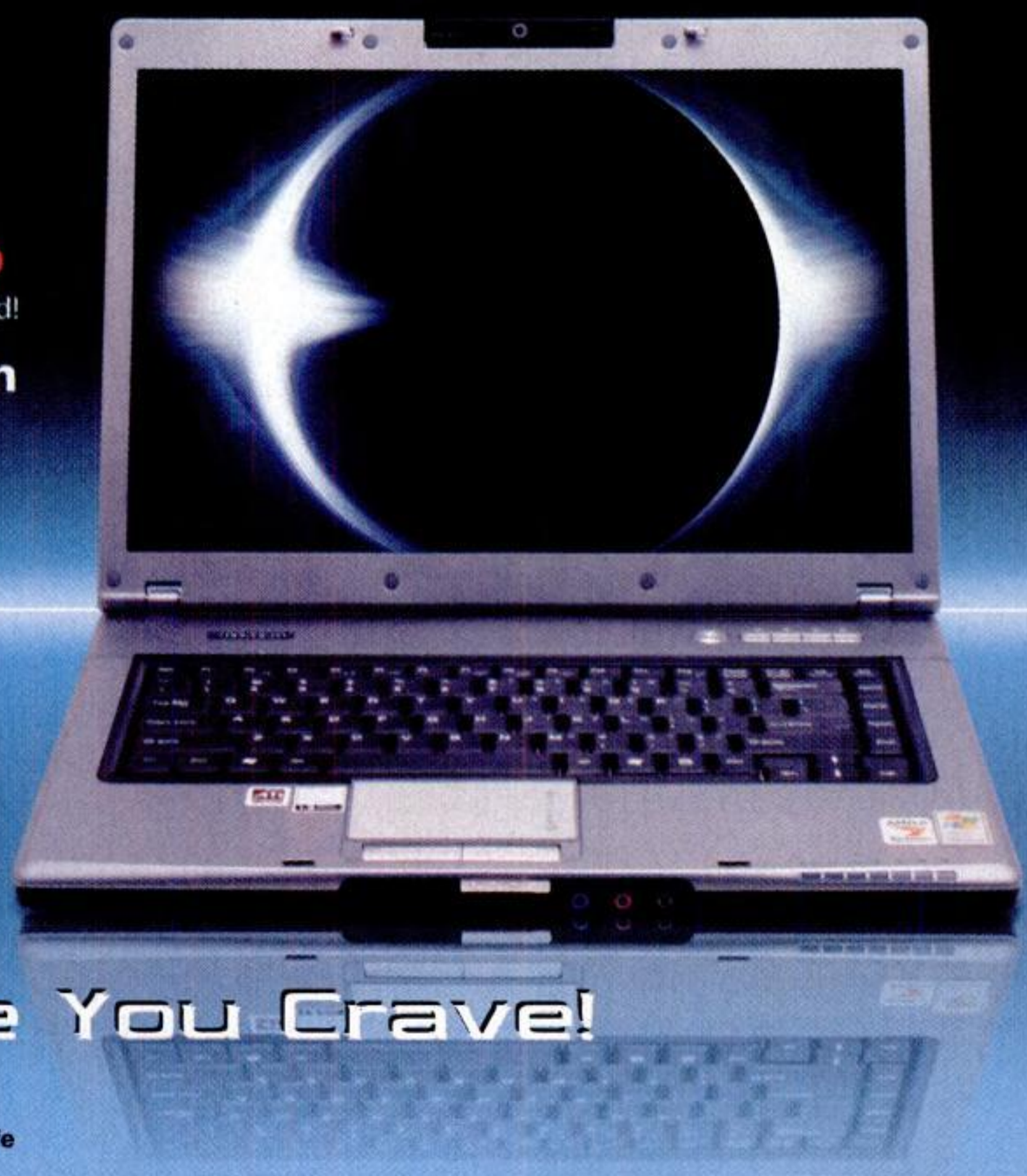

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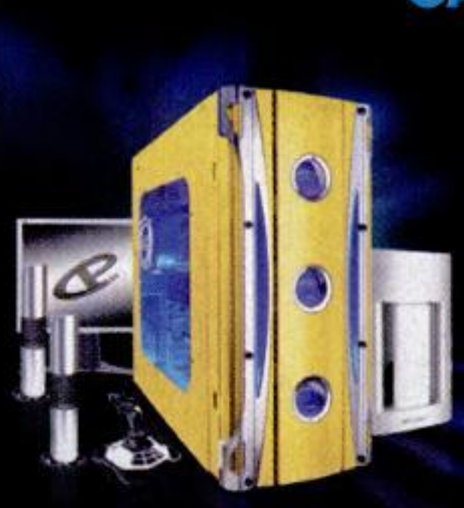

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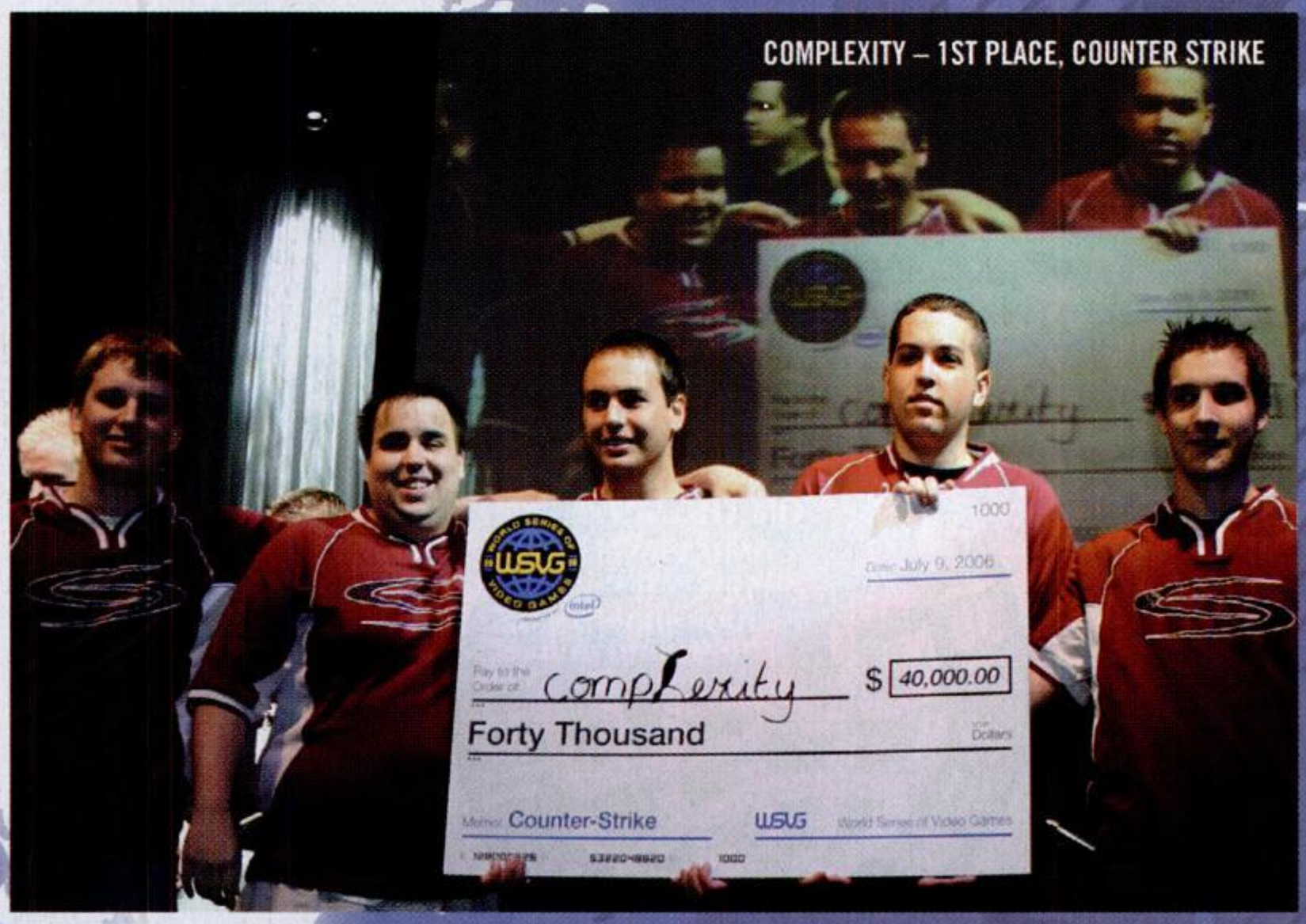

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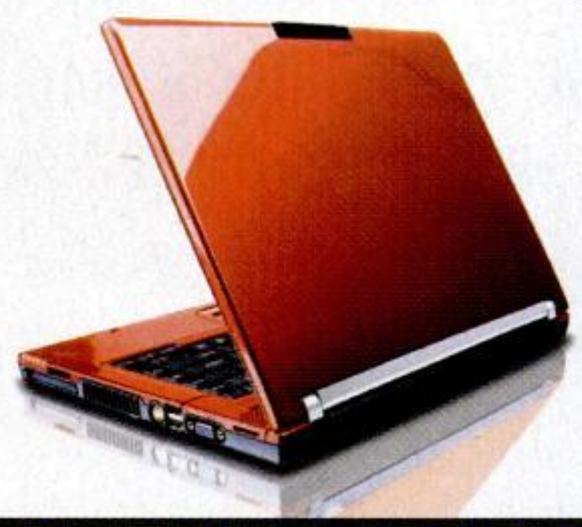

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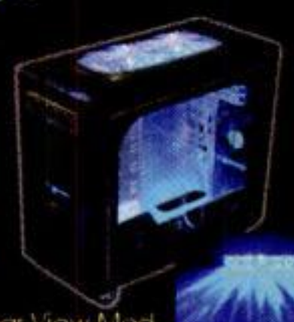

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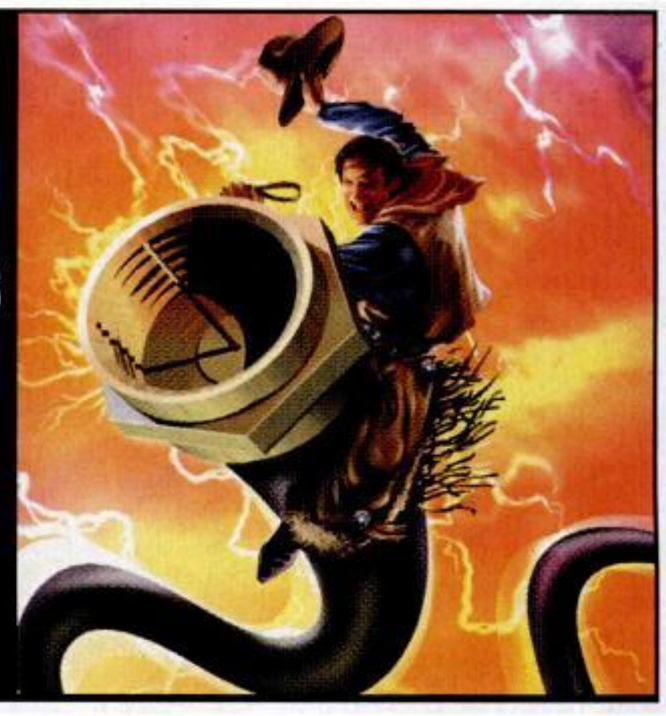

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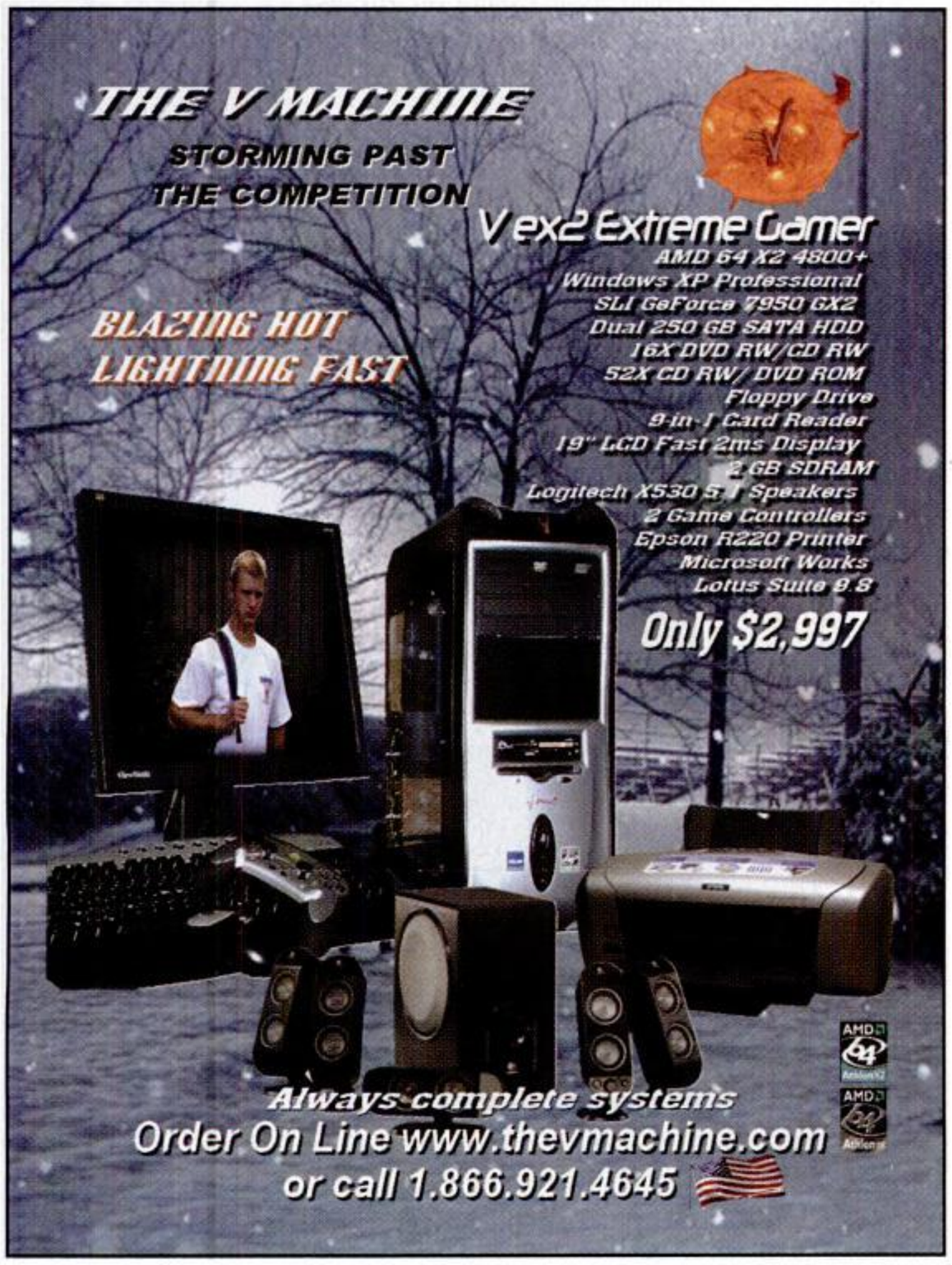

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We tackle tough reader questions on...

✓Core 2 and Premiere ✓TrueCrypt ✓Amtgard ✓JPEG Quality ✓Ray Tracing

HOW IS CORE 2 WITH PREMIERE?

I enjoyed your September 2006 comparison of the Core 2 Extreme and the Athlon 64 FX-60, using identical videocards in your zero-point system. But I'm more interested in the non-Extreme versions of the Core 2. I just can't afford to spend $1,000 on a CPU.

*Because I do a lot of video editing, I'm also curious how much the videocard helps with performance in **Adobe Premiere**? Your tests make it look like $50 and $500 videocards would yield about the same performance in **Premiere**, with only the CPU having an effect on rendering. This would be very useful info if that's the case, as then I could put all my money into the CPU in my editing systems.*

*Also, is there a way to do **Premiere** rendering in real time or near-real time without spending $1K-plus on a specialized videocard? Should I get an expensive videocard made for **Premiere** and a cheap modern CPU to handle everything else?*

—Kevin Campbell

SENIOR EDITOR GORDON MAH UNG RESPONDS: Intel's Core 2 Duo E6700 is a darling little part for the money. It's half the cost of the Core 2 Extreme X6800, yet it has the same amount of L2 cache (4MB), operates at the same bus speed (1066MHz), and is clocked down only 300MHz. The E6700 is multiplier-locked, but you can easily overclock it to X6800 speeds without doing anything too exotic.

Because *Premiere Pro 2.0* offloads some work to the GPU for rendering, a fast videocard is almost must-have. You probably don't need to buy a $500 gaming card, but a Pixel Shader 2.0-compliant DirectX 9 card is essential. For example, *Premiere Pro* (and even *Elements*!) looks horrible on an old ATI Radeon 9600 part, which doesn't have the capability to render the video. *Premiere Pro 2.0* actually does do real-time rendering (to an extent, anyway), provided you have a powerful CPU and videocard. Our own tests show the Core 2 microarchitecture to be favored over the Athlon 64 and Pentium 4/D procs.

IT'S TRUE, WE LOVE TRUECRYPT

*In your September issue you reviewed **Private Disk** and gave it a 9 verdict. It sounds like the software works just like the open-source **TrueCrypt**, but with fewer encryption options. Tell your readers about **TrueCrypt (www.truecrypt.org)**— it works great and will save them $45.*

—Rich Tolliver

EDITOR IN CHIEF WILL SMITH RESPONDS: Since September, we've tested *TrueCrypt* and are happy to recommend it for your encryption needs. In fact, we include it in this month's "Ultimate Utility Toolkit" on page 24.

WHEREFORE ART THOU, CORE 2 MOBOS?

Core 2 Duo CPUs are what we want, so where are the reviews of Core 2 Duo motherboards?

—Gerardi Jimenenez

SENIOR EDITOR GORDON MAH UNG RESPONDS: We hear you, Gerardi. We're just as anxious as you are to see how these boards perform. So far, we've only had our hands on Asus' P5W DH Deluxe Core 2 Duo board, which we reviewed in our October issue. Core 2-ready motherboards have been slow to trickle out, but we have coverage planned for Intel chipset boards, ATI chipset boards, and nVidia boards in an upcoming issue.

WHY STRIPE THE DREAM MACHINE?

I don't understand why you chose to stripe the boot drives in the Dream Machine. Isn't the boot drive mainly used for reading data, not writing? Mirroring the drives gives the same theoretical doubling of read speeds, right? So why take the risk of a hard disk crash with striping? Sure, you get more space,

We Admit It, We Goofed

I enjoyed Gordon Mah Ung's review of the new Mach V (October), but the caption describing the $1,500 paint job on the case mixed up the Society for Creative Anachronism and Amtgard.

The Society for Creative Anachronism is a medieval and Renaissance re-creation group. It's all about creating authentic crafts and combat from that period. No fireballs here; we fight with wood and steel. The group you want is Amtgard, a fantasy live-action role-playing group that uses padded weapons and an elaborate magic combat system. It's like live Dungeons and Dragons—the old pencil-and-paper RPG—only we run around like madmen and throw things at each other.

—Scott Jernigan

Reader Scott Jernigan (pictured here with pal Mike Meyers) was quick to correct us on our SCA/ Amtgard mixup. Thanks Scott!

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but if you're buying Raptors, space probably wasn't your primary concern.

—Gar Higgins

SENIOR EDITOR GORDON MAH UNG RESPONDS: RAID 0 is commonly called "striping" because only a portion of the data is read or written (in stripes) to each of the drives. Striping is generally faster than RAID 1 (mirroring) because less data has to be written or read from each disk. If you have to write 1GB of data to the RAID 0 array, you would theoretically write about 500MB to each disk, which should take less time than writing 1GB of data to each drive, as you would do for RAID 1.

DEGRADING OUR JPEGS

I've heard that JPEG quality deteriorates each time the file is opened or edited. This worries me because my Canon PowerShot S80 takes pictures in JPEG format. Is it true that my photos will deteriorate if I constantly view and edit them as JPEGs? If so, what format would not deteriorate, and how could I convert all my photos at once (there are more than 200)?

—Dennis Wittekind

SENIOR EDITOR GORDON MAH UNG RESPONDS: You do indeed reduce the quality of JPEG images by repeatedly editing and saving the files. The extent of the damage depends on the image editor you use and how you save the files. Because JPEG is a lossy file format and each image editor compresses it differently when you save the file, it will be changed slightly every time you save. Whether you can see that difference is up for debate. You might want to consider saving the file as a TIF, which isn't lossy, or a PSD if you are using *Photoshop*. If you're really worried about quality creep, the best method is to always keep a copy of the original image stored somewhere safe.

WELL, YOU CAN CALL ME RAY...

*While reading **Scientific American** (August '06) I happened upon an article about ray tracing, which is billed as being the key to photo-realistically rendered video games. The technology is nearing the level of public release, so I was surprised I hadn't read about it in **Maximum PC** as a technology ATI or nVidia is looking to implement in near-future graphics card iterations. What's the story?*

—Düdie Silberman

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Ray tracing isn't a new idea; in fact, it's been around since the 1960s. It consists of tracing imaginary rays of light from the camera to objects in a scene. When the ray intersects with an object, more rays are generated in order to produce realistic shadows (where the object prevents some of the light from traveling in the same direction), reflection (where some of the light is bounced back at the camera), and refraction (where some of the light travels through the object and emerges traveling in a different direction).

Ray tracing can create incredibly realistic scenes, but it requires an equally incredible amount of computational power; animating ray-traced scenes in real time—at 60 frames per second or more—is beyond the capability of today's fastest videocards.

WHAT'S THE BIG DIFF?

I know you guys do videocard comparisons all the time, but what the heck is the difference between videocards built by different manufacturers (e.g., Gigabyte, Sapphire, Asus, and PowerColor) that use the exact same GPU?

—Mike Luehr

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: At the risk of sounding glib, the differences can range from none at all to dramatic. ATI and nVidia both build reference designs for their manufacturing partners to follow. Reference designs include core and memory clock speeds, standard cooling designs, and so on. Some board manufacturers follow those reference designs to the letter; while others boost the core and/or memory clock speeds, devise unique cooling systems, and/or add features (such as HDCP support). Board vendors can also differentiate their product by offering special warranty terms, or by bundling a popular game or some other type of product with the videocard. Our videocard reviews, however, place the most value on factors that have a direct impact on performance. MPC

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COMING NEXT MONTH IN MAXIMUMPC'S

GAS-POWERED-AND-READY-TO-BLOW HOLIDAY 2006 ISSUE

2007 TECHNOLOGY PREVIEW!

We've got all the info about next-gen gear—quad-core CPUs, DirectX 10 graphics, 1 terabyte hard drives—plus an in-depth look at what's up with Vista!

GREAT GIFTS FOR GEEKS!

We round up all the neatest, niftiest gifts for PC freaks, so you can make a comprehensive list for Aunt Sally before she buys you that annual pair of argyle socks!

WE LOVE THE LINUX LIVE CD!

Thanks to the Live CD, it's never been easier to test any and all of the Linux distros. We look at our three favorites and help you kick-start your personal march with the penguins.

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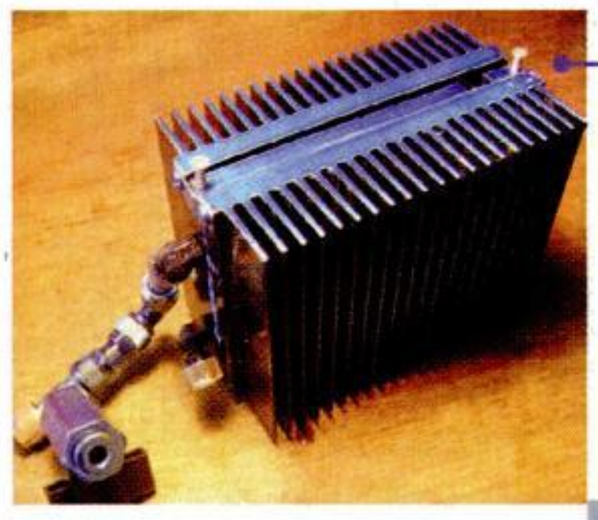
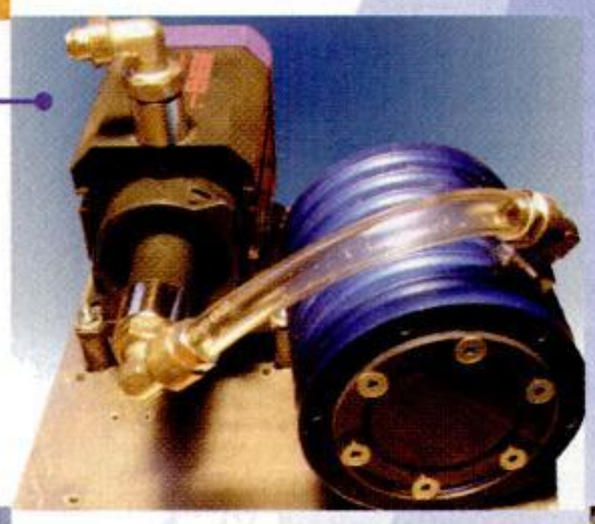
JEFFREY CAPLAN'S

Passive Aggressive PC

Passive cooling... *aggressive* overclocking. Jeff Caplan was inspired to create this rig after a decade of building machines that either compromised silence for speed or vice versa. At the heart of his PC is a low-power, low-heat Pentium M Dothan processor, which when paired with a CT-479 adapter and an Asus P4C800-E, is able to run in a desktop environment. And by outfitting that desktop environment with three radiators and 20 pounds of heatsink extrusion, Caplan is able to push his mobile proc 75 percent beyond spec without the aid of a single noisy fan.



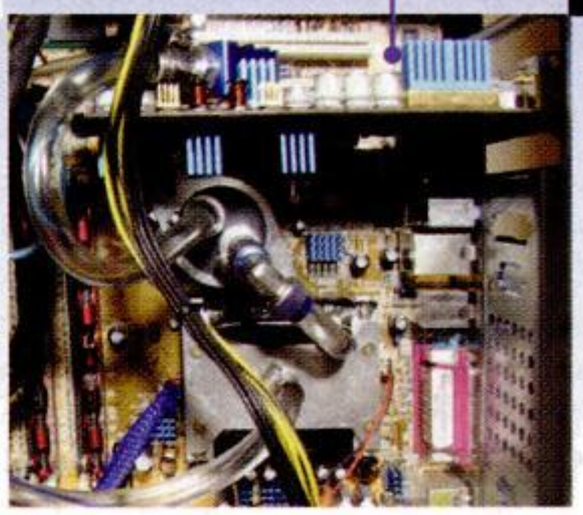
A custom passive radiator resides at the back of the case, behind the PSU. It augments the two radiators on either side of the case, which can be opened like wings for added cooling, although Caplan says that's never necessary.



A 12V Innovatek pump, which Caplan modified with rubber anti-vibration standoffs, silently pushes water through the system.

Water blocks on the videocard, north bridge chip, and Dothan processor keep those parts cool. The video memory and all the MOSFETs are kept chilly with blue, anodized-aluminum heatsinks.

The pump and reservoir pictured above fit into the empty space to the lower left, below two Nexus hard drive silencers and a fanless 500W Antec PSU (at the very top). Heatsink extrusion at the top of the case absorbs the PSU's heat, keeping it below 40 C at full load.



For his winning entry, Jeffrey Caplan wins a $500 gift certificate for TigerDirect to fund his modding madness! See all the hardware deals at **www.tigerdirect.com**, and turn to page 116 for contest rules.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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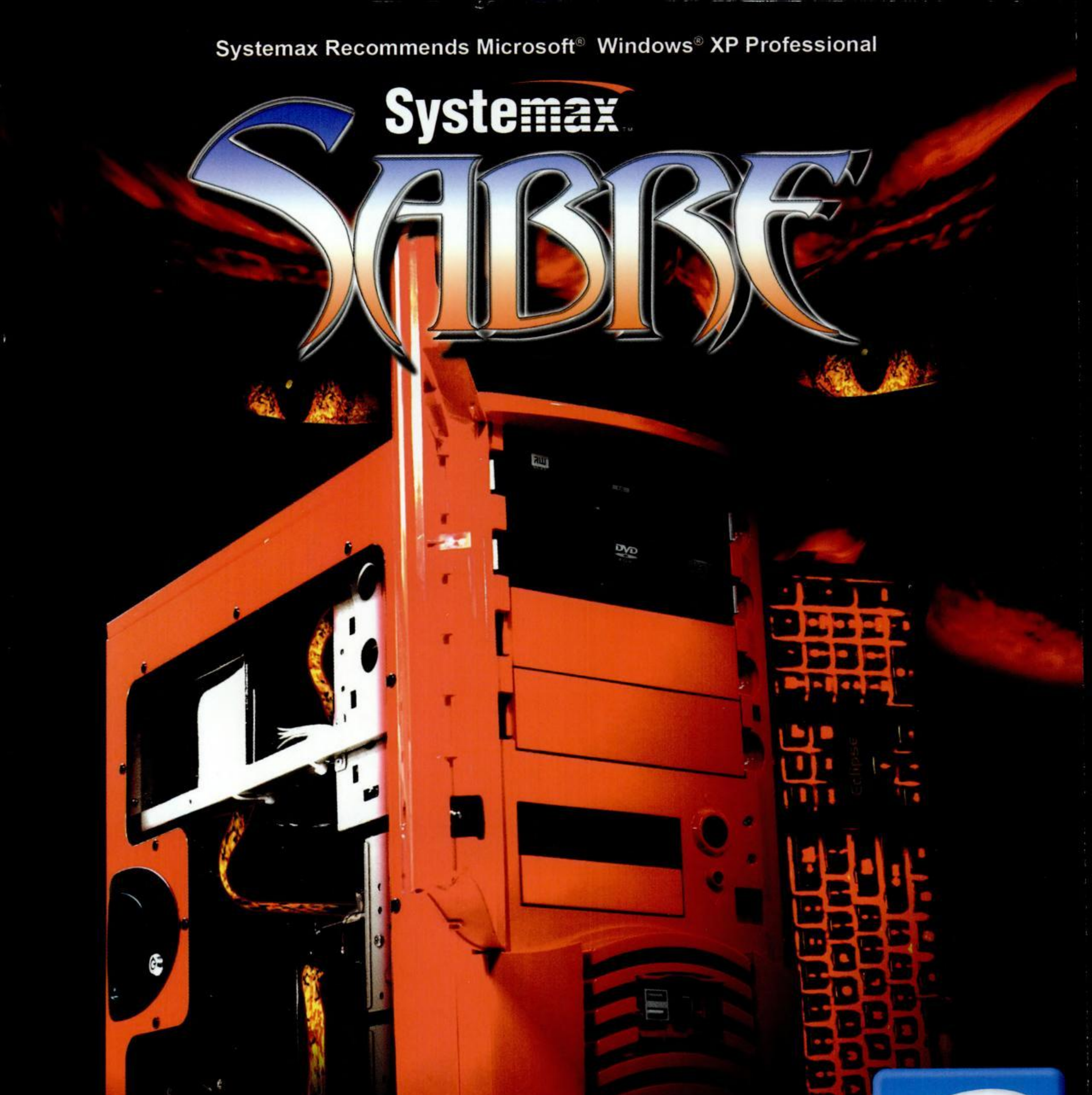

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